Gleanings in Bee Culture

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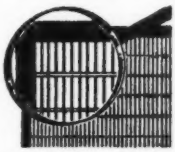

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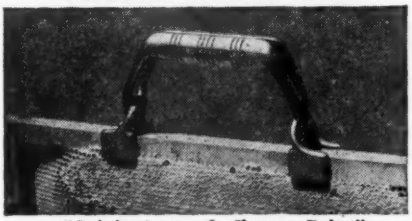

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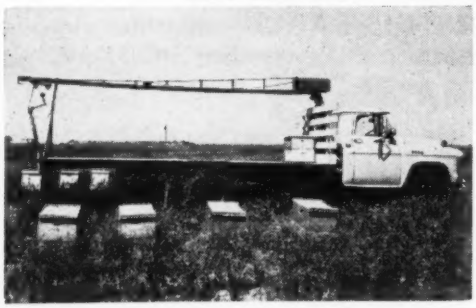

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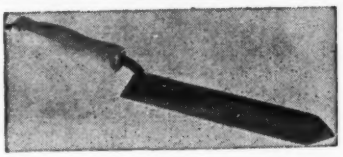

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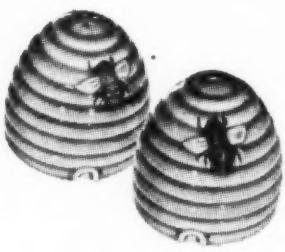

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Looking foward to

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A glance into the future

by R. B. WILLSON, Chairman, Honey Industry Council. A Director of the American Honey Institute, and the National Honey Packers' and Dealers' Association. President of R. B. Willson, Inc., New York, N. Y.

IN BEEKEEPING there is a new day. Paraphrasing Rudyard Kipling, we might say. . . .

. . . And the dawn comes up like thunder,
Out of Honey, USA.

Yes, gentlemen, in August and September, 1955, there was a thunderous roar proclaiming that this is the day of the honey **producer** and there is nothin the foreseeable future that will change it.

The packer and dealer has had his day. With the exception of a brief period at the end of World War I when there was a sugar shortage and for the duration of World War II, when sugar was also in short supply, producers never had a ready market for their product. The packer or dealer could sit back without worry in the full knowledge that whenever he wanted to buy one car, or ten cars of honey, it was out there in the producers' honey houses awaiting his pleasure. The producer was the unending dependable source of supply, and more often than not, after carrying his honey all through the winter hoping for a better price in the spring, he took a lower price than if he had sold in the fall. Banks did not consider the honey in his honey house suitable collatoral for a loan and, of course, he had to bear the costs of carrying his crop month after month.

It was in the era of the honey dealer that the idea of the producer selling honey cooperatively was born. He would join with fellow producers, pack his honey in jars, and sell directly to the consumer trade what otherwise was not moving.

Today the situation is in reverse. If you have produced a carload of honey, or even a truckload, the packer or dealer will seek you out and be after you for it until it's sold. And after it's sold to someone else, he's going to tell you that he hopes next time you will give him a chance to buy.

If this pronouncement sounds revolutionary, it is only because it is a bald statement of fact. And that fact is **the world demand for honey is now exceeding the supply.** It takes only a calm analysis of the current situation to recognize the obvious truth. Let's try to analyze it after inserting parenthetically that the "experts", including this author, did not forsee this. We all thought that the combination of no subsidy for export and a good crop would depress the market when honey became abundantly available this summer. The 1954 crop closed out high because the crop had been very short (215,000,000 pounds) and we had had an export subsidy.

The new crop came on strong (243,000,000) and there was no subsidy. Early crops brought high prices because of the previous scarcity, and then about August 1st there was a perceptible weakening of prices. Here then was what the experts predicted! But in ten days the slight dip in prices was gone and the real forces that make for prices began to assert themselves.

What are those forces? Not necessarily in the order of their importance because the writer cannot say what they are, but more or less we believe these are the principal ones.

1. **European Recovery.** Belgium, Holland, and Germany, especially the

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last named, have made a substantial economic recovery from their devastated financial condition following World War II. Amongst them they take over 85 per cent of our exports of honey. Our benevolent Uncle Sam could not have been more foresighted than to have given our industry an export subsidy **during** the years they were getting back on their feet. Each are heavy honey-consuming countries and now that our subsidy has been discontinued although they have screamed with displeasure at our current high prices, they are buying anyhow, finding that they cannot do without this product of ours that they love so well. A very good demand from France, Switzerland, and Italy has helped along.

2. **Good Times at Home.** Go to the check-out counter of any super market and watch what just ordinary folks buy—luxury items by the score,—including honey, if honey be one. Statistics show the wage earners in our great country have more money to spend now than ever before. Honey is sharing in that prosperity.

3. **Increase in Population Here at Home.** In the author's war we didn't marry the girl until we were safely back home. In World War II, they married the girl first so she would be there to come back to, often with one or two added, and now that enormous crop of babies of 1943, 1944, 1945, 1946, 1947, and 1948 are honey eaters and daddy is making good wages so he can buy lots of it. Just think of it! Our country is growing at the rate of two million a year!

4. **Continuous Honey Promotion.** Years of servicing the daily press and the weekly and monthly publications of the United States, and more recently Canada, with intelligent, attractive, and useful information about honey, which has been the steady five-star performance of the American Honey Institute, is now paying off. Those checks for five and ten dollars from producers, some larger, some smaller, and the still larger checks from the packers, dealers, coops, and bee supply manufacturers, have most skillfully, under the direction of Mrs. Harriett M. Grace, been turned into a voice of subtle persuasion to buy and use honey. Never a sledge hammer blow, but always a gentle approach that has made the material going out from Madison, Wisconsin, as welcome to the food editors of America as a letter from an intimate friend.

Present day families are becoming large, and as a result of this population increase, beekeepers are getting a bigger potential market for honey.

In this connection too we must credit the honey promotion efforts of the American Beekeeping Federation for National Honey Week going back to the leadership of Roy Grout and continued with Henry Schaefer and his stalwart chairman of the Committee on Marketing, S. Joaquin Watkins.

Looking ahead to 1956 will show an accentuation of all four of the above factors at work. Honey prices will gradually rise until these prices will be sufficiently high to reduce the demand to meet the supply.

There will be some casualties en route. The first and most important one is the American baker. The biggest use for honey is in bread—and bread is an item that one can't fool around with much as to price. There's lots of bread being made with nine cent sugar. Honey even at 15 cents to the baker stood up very well in 1954-55, but honey at 17 cents or higher processed and delivered to the bakery is bound to show some casualties that will be sad news indeed to the honey industry. This will tend to slow down the advance in honey prices.

Another casualty will be the hard-boiled packer or dealer. Still another will be the organization which has made the producer wait all year for his money and then returned him a lower than market price. The beekeeper who produces a carload or even a truckload of honey will be importuned by numerous buyers bidding against each other. The dealer who gets the honey will have a favor bestowed on him by the producer and it will be the rare exception that deals are not for cash on the barrelhead.

Another casualty follows as night follows the day. To do the honey business will take more and more money. The dealer who is not well heeled will pass out of the picture. More and more dealing in honey will become big business with an increasing tendency towards speculative buying, that is, buying when honey is harvested against the hoped-for demand that will come later on. The packers, dealers, and exporters may be in for some rough years.

So, Mr. Beekeeper, your future is bright. It will be increasingly valuable to hold on to good locations. Good prices for honey should result in complete new mechanization of your honey house and the turning out of a still better product for market. Your income will rise and subsidies for honey will soon be forgotten, just as will be the support prices from which honey has run away. By the way—what is the support price for honey anyway?

Hairy Vetch in Oklahoma

FRANK WELLS. Ripley, Oklahoma

HAIRY VETCH is grown in this part of Oklahoma generally as a soil builder, for pasture and seed production.

It is usually drilled in 15 to 20 pounds per acre along with small grains, such as wheat or rye.

Hairy vetch makes a very good winter pasture, builds up the soil and produces from three to seven hundred pounds of seed per acre, that is harvested along with a near normal small grain yield. A special separator is used to separate the vetch from the small grain.

Adequate honeybee pollination increases the seed yield greatly. Because of the varied populations of other pollinating insects in different localities and the difference in seasons the value of honeybee pollination varies.

Most or all the seed growers, I think, realize the value of honeybee pollination and welcome the bees to their fields, but few care to pay a pollination fee. Some offer to transport the bees.

The vetch blooms for about a month, beginning the first part of May, reaching its peak about the 20th, then tapering off usually to the beginning of the sweet clover bloom.

Hairy vetch, here, is a pretty dependable source of a very mild fine flavored light honey. At bloom peak a strong colony will gain as much as 13½ pounds a day or maybe more with a variation depending on climatic conditions and distance from ample bloom. A season's crop I estimate varies from 40 or 50 to more than 100 pounds per colony, also depending on climatic conditions and ample blooms.

XUM

Royal jelly: boon or boomerang?

TAGE S. K. JOHANSSON,

Queens College, Flushing, New York

Tage S. K. Johansson

IT IS generally accepted that bee milk (called royal jelly when found in or taken from queen cells) is secreted by pharyngeal glands in the head of worker bees. All larvae up to two or three days old are fed bee milk, after which time larvae destined to become workers are fed honey and pollen intermittently in small quantities. Queen larvae are fed bee milk copiously, providing a basis for the quantitative theory of queen differentiation.

Composition. Several chemical analyses of bee milk have been made since 1852 showing considerable variation for a number of reasons (e.g. procedures, sources, preservation, etc.). A representative formula or assay method is not available at present.

Vitamins A, C, D, E, or K do not seem to be present, or the quantities are insufficient for detection. The B vitamins are in good supply with pantothenic acid particularly high as it is in liver. The 20 amino acids in bee milk are equivalent to those in whole milk, eggs, and liver. Pollen is a frequent component which would seem to imply precautions in the use of royal jelly by those afflicted with pollen allergies.

Biological Activity. The results from investigations of the hormonal (on white rats) and fertility (on fruit flies) effects of royal jelly are conflicting. The enlarged adrenal and diminished thymus glands in rats given high doses suggest a shock or stress reaction such as is seen with large doses of cortisone.

Gardener's paper on royal jelly's effects on fruit fly longevity has been frequently misquoted. The life span of fruit flies is increased very slightly with large doses and decreased slightly with some fractions of royal jelly. However, pantothenic acid (a B vitamin) strikingly extended the life span in pure form and especially in combination with other vitamins.

There have been many innuendos and inaccurate conclusions drawn from the difference in life span of worker bees and queens. The longer life of a queen is understandable when the difference in metabolic activity is assessed. A flying bee uses up nearly 200 times as much oxygen per hour as a hive bee does in cleaning (cleaning and egg laying probably approximate in expenditure of energy). Overwintered, broodless bees live longer and a few have survived 320 days. Aging in bees is probably a physiological condition as in man and other animals. In **Cowdry's Problems of Aging,** A. I. Lansing concludes that most theories of longevity reflect the opinions of their sponsors rather than experimental facts.

Crystals have been prepared from royal jelly which appeared to have

(For references and amplification of this synopsis see Bee World, January and February, 1955.)

bactericidal properties against four species of bacteria.

Weaver has successfully reared queens experimentally outside the hive by using **fresh** royal jelly (**Science,** April 8, 1955; **Gleanings,** June, 1955; **Bee World,** Sept., 1955). Larvae fed royal jelly stored under refrigeration or dessicated to a heavy paste developed into intermediate or workerlike forms. He concluded that there must be present an unstable growth substance which at present cannot be preserved.

Human Uses. No verifications or clinical studies by impartial parties have yet appeared in the literature and so the remarkable cures attributed to royal jelly remain unsubstantiated. It would be a fairly good source of the B group vitamins but an extravagant one at current prices. Cosmetic claims have not been studied under clinical conditions.

The ingredients in royal jelly (by analyses to date) are more readily and economically available from other sources. If it is found to be a good source of some useful material, its production would be a profitable occupation for beekeepers (especially in those areas of South America where the climate makes queen rearing possible the year around and inexpensive labor is in ample supply).

Apparently Mr. R. B. Willson's article in **Gleanings** for February, 1954, was the first discussion in this country of therapeutic uses for royal jelly. In May, 1954, an elaborate promotional campaign was let loose on the American public (R. B. Willson, **American Bee Journal,** Feb., 1955).

Lilly Dache, a hat designer with interests in a cosmetic firm, came back from Paris with one ounce of jelly she claimed to have paid $5,000 to obtain (an extravagant overcharge). Miss Dache was reported to have interviewed Dr. R. Chauvin of the Beekeeping Research Station, Bures-sur-Yvette, France who referred her to Cornell University for answers to her questions. (**N. Y. World Tel. & Sun,** July 1, 1954). Dr. Dyce at the Department of Apiculture at Cornell University reported in **Gleanings,** Sept. 1954 and the **American Bee Journal,** Nov. 1954, that they did not have any data on human applications of royal jelly and were only in the preliminary stages of research anyway. It appears that the publicity agents have been pulling at straws.

The lists of preposterous claims that have been reprinted in this country from European and Mexican sources have left out the more odious ones such as cures for Parkinson's disease and Cancer. (**Tierra,** Oct. 1953). The emphasis has been on the improvement of well-being and feelings of euphoria (shades of monkey glands). Can we presume that the greater the cost the greater is the psychological effect? Inexpensive sugar coated pills might also have a beneficial effect on the morale of a person suffering from symptoms which have no physical origin.

It appears that many of the investigators who have been interested in bee milk have tucked in their coat tails to avoid further publicity in connection with its use as a therapeutic and cosmetic material. As I wrote these paragraphs, I telephoned an investigator to ask permission to use some data for this article. I was turned down with the statement, "We would rather not have any more publicity". When I raised the question of future work, I was told they were not contemplating any because the whole business had gotten so colored that if they associated with it in any way some of the color would undoubtedly rub off.

An investigator with integrity and professional reputation at stake cannot afford to be associated with the prostitution of scientific data. It appears there is danger that the geese (investigators) that have laid the golden eggs (royal jelly data) used by the promotors of royal jelly may be strangled and their cooperaton in this area lost. They would rather desert this field than get mixed up in the misleading, often inaccurate publicity that goes with every statement and scrap of information they might let slip.

There is a great deal of misunderstanding of the methods and ethical standards of scientific investigation. This is not the time to discuss it at any length but perhaps a single hypothetical experiment will illustrate the point.

How would you test experimentally the assertion of an octogenarian that he owed his long life and continuous feeling of well-being to the fact that he had eaten pigs' feet every Saturday for supper? Your only reaction might be to laugh **with** the old gentleman and

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Beekeeper and laymen are now confused about the virtues of royal jelly.

assent that in his particular case this might well be true. Let us presume for a moment that there is cause for setting up a serious investigation of this assertion. Would you not agree that the following steps are essential?

1. A careful design must be used to select subjects from all social levels, occupations, countries, etc., who will cooperate in the experiment till their deaths.

2. Sufficient numbers of cooperators in this feeding experiment must be found to assure an adequate statistical sample.

3. Every reasonable precaution must be taken to avoid loading the results; e.g., it would not do to have anyone even remotely associated with the business of packing pigs' feet involved in the experiment. They must certainly not have anything to do with the administration of the experiment, analysis of the data or writing of the reports.

4. Adequate supervision must be supplied to be sure that each cooperator does eat pigs' feet every Saturday night and only then, with amounts, source, cooking methods, etc., standardized.

5. When the experimental results are all in—that is, when all the cooperators have died—then an analysis of the results can be undertaken and tentative conclusions drawn.

6. The conclusions will be strengthened if similar experiments by other investigators provide similar conclusions.

This is a ridiculous example of the much heralded scientific method. It boils down to using common sense in conducting experiments with as many reliable instruments as are available. A new constant for the speed of light was published recently as the result of a better method of measuring it. In scientific as in all human endeavors every conclusion is inevitably a tentative one. It is apparent from even a casual inspection of the present published data on royal jelly that the extravagant claims and innuendos made for its powers are not warranted

If no proper human use is found for royal jelly, what will public reaction be? Let us hope then that this publicity will be forgotten as just another publicity agent's success story. At **worst,** annoyance might turn against the beekeeper and his honey product on the assumption that he has lined his pockets. At best, this tremendous interest about royal jelly may be channeled into various aspects of bee biology and create a genuine cultural interest in bees. The danger in pressing an interest in fads (such as miracle claims for royal jelly and honey) is that they are in constant jeopardy of being displaced by another fad.

If beekeepers aspire to the status of "apiculturists" they must conform to the ethical standards of other fields of scientific agriculture. In the constant effort to find the **truth** with objective methods, articles written for the beekeeping journals should include proper documentation so that the reader has some basis for judging the accuracy of the printed page.

Dr. Eva Crane read a paper at the 1954 International Beekeeping Congress in which she stated: "It is probably no exaggeration to say that in the years before 1949 the **lack of adequate documentation was one of the greatest hindrances to advancement in beekeeping".**

Our Cover Photo

HERE IS another interesting photo by the famous German beekeeping photographer, W. W. Wittekindt. The skier is standing before some German beehives. It appears, upon closer examination, that three colonies are wintered in these cases.

Is this plant destined for greatness?

Bird's-foot trefoil

HARVEY B. LOVELL
University of Louisville

THERE HAS recently been a great increase in interest in bird's-foot trefoil (**Lotus corniculatus**). This plant is a legume related to the clovers and alfalfa. It has an extensive root system on which develop nodules containing nitrogen-fixing bacteria which enrich the soil with nitrates. The stem varies from prostrate to erect. Prostrate varieties have some advantages for pasture but erect varieties are easier to cut for fodder or seed harvesting.

There are two main varieties: a broad-leaved one and a narrow-leaved one. Although the name trefoil means three, there are two smaller leaflets making a total of five for each compound leaf. The flowers are large and yellow but often have a reddish tinge when fully developed; in fact, one variety has flowers which turn orange red as they wither.

F. C. Clements, the famous flower ecologist, wrote that bees in search of nectar alight unerringly on the fresh yellow flowers, for they have learned from experience that the dropping red ones have no nectar left.

Charles Mraz writes me that in Vermont the broad-leaved varieties have large blossoms with almost no red coloring but are a brighter yellow. The seed pods stand out at right angles from the stem (peduncle) in such a way that they resemble the toes on a bird's foot, hence the first part of the name (see photo).

Bird's-foot trefoil succeeds in soils where alfalfa will not grow and lasts longer than alfalfa. However, since its stems are rather weak, it tends to fall down and lodge on the ground if planted by itself. To prevent this it is recommended that it be planted with timothy or bluegrass. It takes longer

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to establish than most legumes and may make a poor showing the first year. It stays green through the summer, however, in places where pastures are usually brown and dry. I observed a two-acre patch of bird's-foot trefoil in Pellett Gardens at Atlantic, Iowa, two years ago in the middle of June. It was in full bloom and covered with bees. It was planted 15 years ago and has completely taken over the ground crowding out the weeds very successfully. However, Frank Pellett reported that he was unable to identify any increase in his bee hives which he could assign to this legume probably because of the small size of the plot.

As a honey plant there have been a number of very favorable reports concerning bird's-foot trefoil. One of its chief supporters is Charles Mraz of Middlebury, Vermont. He writes that in a good season, the flow from it is terrific. As much as 100 pounds has been harvested and a 50-pound surplus is average where large fields are available. When in full bloom, a field has a smell "resembling pansies and the fresh honey tastes something like old-fashioned rock candy." Mraz adds, "In this area it does best on our clay in lake bottom soil. Its yield of honey depends upon weather conditions. It does better with sufficient rain and unlike alfalfa here, trefoil will do well with a high water table."

Another beekeeper in Vermont, William Butterfield of Shoreham, is also a supporter of trefoil as a honey plant. He writes me that it blooms from July 10 to August 25 and that the honey is light colored with a heavy body and a good flavor. He adds that it has the faint odor of pansies, and that he makes about a 25-pound surplus.

Ray Bender, Westport, New York, is a great booster of trefoil as a forage crop. He reports that trefoil and clover start blooming at the same time but that trefoil persists longer in bloom. He finds that bees gather a lot of pollen from it, but apparently do not make a surplus in his locality.

Roger Morse, now a Florida State entomologist, has recently written a thesis on the pollination of trefoil at Cornell University, tested some samples of this honey and recorded a Pfund rating of 25 to 35 which is in the range of white honey. Walter Barth Associate Editor of Gleanings, also studied the nectar concentration of this legume in New York State and found that the sugar concentration was 48 per cent, a high amount for any nectar, and one that will keep the bees coming back for more.

Keith Faulkner of Plymouth, Indiana, wrote me that this is the best new plant in his area. "Two years ago we extracted our crop from one yard of 20 colonies and nine days later our combs again filled with an enormous crop of trefoil honey. We took this too, and the bees went on and filled up in fine shape for winter." Later he told me that the honey was a light amber with a reddish tinge. This is darker than the honey in the east and may have been due to the admixture of some other kinds.

At the Soil Conservation Nursery at Winona, Wisconsin, Mr. Thor K. Berg reported an excellent yield of honey from 7.5 acres of trefoil (as reported by F. C. Pellett, **A. B. J.** Dec. 1948). Twenty-five hives made an average of 90 pounds of honey and 70 pounds were left for winter. The honey was very light in color with a mild flavor. One beekeeper who tried it declared it was the finest honey he had ever tasted.

From Saskatchewan Percy Wright reports that bird's-foot trefoil is the only new clover attractive to bees which is both hardy and a reliable seed producer.

There are several other species of **Lotus** in the United States, some of which are often called trefoil too. In Florida two to three thousand acres of the greater trefoil (**Lotus uliginosus**) are now planted, and according to Roger Morse, the acreage will probably increase.

In California bush lotus (**Lotus scoparius**) grows in dense masses on hills and mountain sides. According to the late G. H. Vansell, it comes into bloom about the same time as the black sage and will cause that honey to crystallize. The honey is white in color and of excellent quality. There is a surplus gathered in San Luis Obispo and Tulaire counties of California (Bu!!. 417 Nectar and Pollen Plants of California). Still another species generally called Spanish clover (**Lotus americanus**) which is abundant in the Sacramento

(Continued on page 759)

Author questions legality of term "honey candy".

Honey candy packaging and merchandising

W. H. CHILDS, Technical Editor, The Manufacturing Confectioner, Chicago, Ill.

"Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."
— Elegy by Thomas Gray

YOUR KITCHEN-MADE candies—caramels, plain and chocolate coated creams, divinities, fudges, hard candies, marshmallows, nougats, popcorn, and pectin jellies—made with honey are most delicious. You are pleased with your efforts. With more practice, you are sure that their appearance can be improved. How may these homemades best be marketed?

Candy is considered to be an "impulse" item. That is why displays are often located near the cashier's cage in chain stores. Assortments of five cent and ten cent bars and rolls lure away stray change from customers. Lavish displays elsewhere in the store are designed to catch the shopper's eye. In a buyer's market, such as exists today, there is fierce competition for the shopper's money.

You are an experienced seller of honey. Why not try a "tie-in" deal? If you will pardon a little criticism, the writer thinks the sale of honey could be increased through informative labeling. Never has the writer purchased a five-pound pail of honey labeled with more than the bare facts—kind, weight, and name of producer. No indication as to the multitudinous uses of honey is given. The homemaker knows some uses for honey but likely has tried only a few. Many city home-makers are harassed these days and lack the time to attempt new recipes.

Recipes showing how honey may be used in cakes and cookies, candies, jams and jellies, meringues, salad dressings, and sauces may be attached to pails, or arranged in attractive folders for distribution. Your honey containers offer an ideal advertising medium for your new candies made with honey. Combinations of honey and candy can be offered at an attractive, introductory price.

Packaging Suppliers Can Help You

Suppliers of packaging materials can offer much advice and almost unlimited choice of findings and intrinsic materials—partitions, lace paper, fancy foils or papers, ribbons, etc. Visits to several candy outlets will prove helpful in securing ideas. Remember, proper packaging helps sales. The array of materials available for containers is vast—cellulose, glass, metal, paper, plastic, and wood. Combinations are almost infinite in number—often, it is

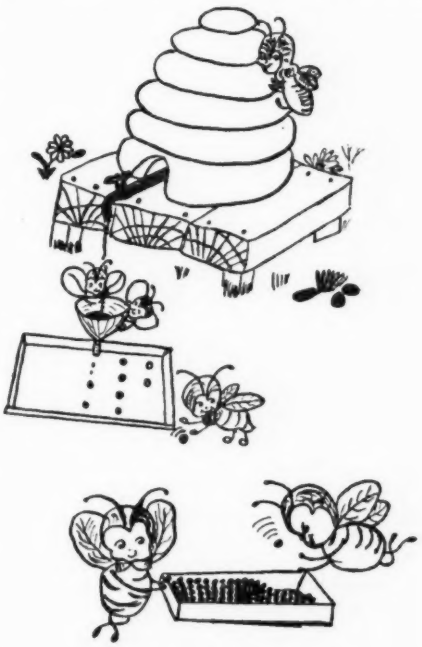

Illustration by Erika Barth

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difficult to make a choice without expert help.

Even though boxed, certain candies are often wrapped. Hard candies, taffies and butterscotch, are attractive when wrapped individually in cellulose. Plain caramels may also be wrapped in cellulose though a glassine or waxed paper is satisfactory. Fondant wafers are very delicate and fracture easily. Three or more of these may be wrapped in foil and the group inserted on edge in a box of assorted candies. Colored metal foil adds to the distinctiveness of a box of packaged candies. Marshmallows and popcorn do well in bags, the former in transparent cellulose, and the latter in waxed or glassine paper bags.

Successful promotion of one or two kinds of candy may lead to the wish to expand operations and produce a complete line of candies. This will mean the packaging of assortments in addition to the "straight" packs. The composition of the assorted box may well vary according to your clientele. Many such boxes are packed to order in front of the customer.

Assortments are not standardized by the industry. Chocolate creams in five or six flavors—lemon, maple, orange, mint, raspberry and vanilla; nougats, caramels, bon bons, jellies, and chocolate covered cherries make a good assortment. Both dark and light chocolate coatings are often present in a box. The presence of fruit and nut centers makes for a more expensive line. From about 26 pieces per pound and up to 35 will give an idea of the average weight per item. Nougats and caramels are the heavy-weights: the creams are the light-weights.

Price is a stumbling block. Many people object to paying over $1.00 per pound for candy. To get around such opposition one can always try selling a box of 14 ounces for one dollar. Price must cover cost of ingredients, labor, supplies, overhead, and leave a margin of profit.

Is it Legal to Say Honey Candy?

The correct labeling of your candy is important. Four factors must be considered: (1) name of product; (2) net weight; (3) list of ingredients; and (4) name and address of the manufacturer (yourself).

The name, "Honey Candy", would likely be illegal because of the FDC Sec. 403 which states, "The labeling of a food which contains two or more ingredients may be misleading by reason (among other reasons) of the designation of such food in such labeling by a name which includes or suggests the name of one or more but not all such ingredients, even though the names of all such ingredients are stated elsewhere in the labeling."

Stick-on labels listing ingredients may be convenient when operations are just getting underway. Boxes and bags can be obtained printed as you wish. Designs may be elaborate or plain. Although package appeal interests the puchaser, quality of merchandise inside will create repeat sales.

And, getting back to the "tie-in" deal—honey and candy: Let the customer know that your candy is made with liberal portions of your brand of honey. "Nature's Sweets — Delicious To Eat," might be a slogan to start with unless that has been copyrighted. A "flyer" inserted in the box of candy could call attention to the merits of honey as a food. Candy, too, is delicious food, and as the National Confectioners' Association adds, "Enjoy some every day!"

Nectar Secretion

LESLIE BURR, El Centro, Calif.

AS AN ADDED item to the article by Milton Savos of Oregon State College, appearing in Gleanings, September, 1955, and entitled as above, I will state that here in El Centro, where the streets are lined with palo verde trees which bloom during April each year, the period of bloom lasting about a month, there have been two years during the past 20 years when the bees gathered a surplus.

The usual thing is that they get enough nectar to breed up on and no more. Two years ago during the height of the palo verde bloom the queens stopped laying. All the bees got from the bloom was pollen, and they had to be fed, in order to build the colonies up for alfalfa flow that commences about the last week in May.

On the other side of the picture, the athol which is the principal shade tree, has always yielded a surplus during the same 20 years. The athol, also known as "tamarix" follows the alfalfa bloom.

Beekeeping in Ohio

S. E. BAILEY
State Apiarist, Division of Plant Industry, Ohio Department of Agriculture

Seymour E. Bailey

THE STATE of Ohio has a land area of 41,263 square miles. In shape, it is almost square with practically 200 miles on each side. The topography varies from very flat in certain areas of northwestern Ohio to fairly hilly in the southeastern section. The greater portion of the State is moderately rolling. The climate is relatively moderate due to the location in the inland temperate portion of the United States.

Ohio ranks high in both agricultural and industrial production. Approximately 22,000,000 acres of Ohio land are devoted to the raising of livestock and farm crops.

The United States Department of Agriculture Crop Reporting Service estimates that Ohio's bee population numbered about 290,000 colonies in 1954 and that the annual production of honey is from 10 to 12 million pounds. However, the cross-pollination of the many agricultural crops is the most important and essential service which Ohio's bee colonies contribute to the State's agriculture.

Ohio can best be divided into two principal beekeeping areas (primary and secondary) from the standpoint of honey production. These areas coincide rather closely with the two basic soil regions found in the State; glacial limestone soils in the west and sandstone and shale soils in the east. Beekeeping in varying degrees is carried on in all of the 88 counties in the State. There are no extensive areas anywhere which cannot be considered favorable for beekeeping on at least a limited scale under normal weather conditions and proper colony management.

Little white or Dutch clover is distributed over the entire State and is a most important nectar producer under favorable conditions. Two of the cultivated clovers, alsike and red, are practically State-wide in distribution. In recent years Ladino clover and some bird'sfoot trefoil plantings have been made in various parts of the State.

Red clover is not usually thought of as a major honey plant. However, this legume has been the source of a good honey flow during the late summer period in certain years.

Primary Area

This area, which covers approximately the western half of the State, comprises the glacial limestone soils which are best suited to the growing of sweet clover and alfalfa as well as most of the other legumes. Most of the commercial apiaries are located in this area.

Dandelion, which blooms about May 1st, is an important honey plant throughout the State. However, it is most plentiful on the limestone soils of this area. This plant is the principal source of pollen and nectar for the spring build-up of colonies.

The source of the greater portion of the honey crop produced in this area

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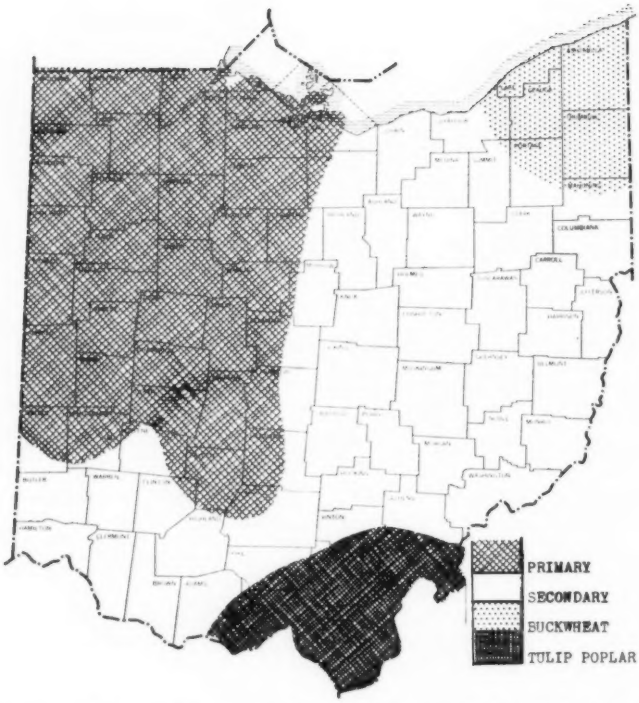

is sweet clover, alsike clover, and Dutch clover. However, as stated above, red clover does sometimes furnish a late summer flow. This is also true of alfalfa which produces during hot dry weather.

Fall asters grow in abundance on certain type soils found mostly in the southern portion of this area and usually furnish a good honey flow in late September. Otherwise, there are very few fall nectar producing plants. Some commercial beekeepers find it profitable to remove all the clover honey crop from their colonies and then move the bees to locations where aster and goldenrod are abundant so they can obtain winter stores.

Soil types, crop rotation practices and many other factors which affect beekeeping vary considerably throughout this intensively farmed region. Any beekeeper should become familiar with and thoroughly study these factors in evaluating apiary locations.

Secondary Area

This region includes the balance of the State. Practically all of the soils of the eastern half of the State are of sandstone and shale origin and are naturally acid.

The soils in the southwestern counties included in this area are of glacial limestone origin, but of an earlier period than that to the north. The lime in these soils has leached out over the ages to such an extent they are now acid.

Most of the bees in this area are kept by amateurs and hobbyists. A majority of the apiaries contain from one to ten colonies. For instance, in Cuyahoga County (Cleveland area) which is largely urban, there are approximately 900 beekeepers with a total of 4,200 colonies of bees.

The honey plants in this secondary area are more varied and bloom over a longer period than in western Ohio. Black locust sometimes produces a surplus in the southern part of the State.

Dutch clover and alsike produce most of the midsummer honey flow. In the fall period both aster and goldenrod can usually be depended upon to produce enough for winter stores and often times considerable surplus.

Large acreages of land in a number of the southeastern counties has been torn up and turned over in strip coal mining operations in recent years. In certain places this has brought lime to the surface. Where this has occurred, sweet clover grows very well and some good honey crops have been obtained.

Two special sections within this area are worthy of note (see map).

Buckwheat Section

The northeast corner of the State is about the only section where buckwheat produces nectar and bees store a surplus of this dark honey. Buckwheat plantings vary from year to year and thus affect the crop obtained. Reports are that there has been quite a reduction in acreage in recent years.

What is EAS?

WILLIAM K. DAVIS, Publicity Director, Eastern Apicultural Society

Officers of the Eastern Apicultural Society are left to right: Roy Stadel, Vice-President, Conn.; Maxine Manchester, Sec.-Treas., Vermont; J. Gaston Levitre, President, R. I.; and W. K. Davis, Publicity Director.

THE EAS (Eastern Apicultural Society) was born during the meeting of Eastern States Beekeepers at the University of Maryland in June, 1955.

Although the name of the organization gives one the impression that the scope of EAS might be a little "long haired" and imposing, it is nothing of the sort. Its aims and purposes will greatly benefit the small beekeeper once its program gets underway.

Its birth was enthusiastically heralded by delegates representing approximately 14 Eastern States and the sincerity of its creation greatly impressed those who attended the meeting at the University of Maryland.

All those desiring to participate in its programs will be welcomed. EAS planning will be long ranged but its main purpose is to bring together small beekeepers from various state organizations into one united brotherhood for the benefit of the local organization and the beekeeping industry by and large.

It will be noted that its officers were chosen from the New England States mainly because it was unanimously agreed that the first annual meeting of the society should be held in New England. EAS conferences will be held annually in various sections of the Eastern States, preferably at some university site since the meetings are twofold—educational and recreational in scope. The 1956 conference will be held at the University of Rhode Island, July 13 to 15. As the site of the annual meeting will rotate from State to State, officers will be appointed from the vicinity of the next annual meeting.

Being cognizant of the need for new ideas and the ever-changing trends in beekeeping the organization will include in its program young men well versed in their particular field of beekeeping. Since these young speakers will be well chosen from the various specialized fields in which they are now actively engaged, valuable information will be available to those beekeepers who attend the conferences.

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Minnesota, Iowa, and California are leading wax producers

Production of beeswax

RUSSELL H. EICHMAN, Cleveland, Ohio

MY ARTICLE "The History of the Beeswax Industry" that appeared in the September Gleanings outlined the very earliest beginning of the beeswax industry. It is now appropriate to turn our attention to the course of beeswax production in this country.

A listing of the total pounds produced by various years is given in Table 1. This information has been depicted in Fig. 1 on opposite page.

Table I

PRODUCTION OF BEESWAX

Year	Pounds	Year	Pounds
1840	628,303	1936	2,655,000
1850	872,576	1937	*
1860	1,322,787	1938	*
1870	631,129	1939	2,715,000
1880	1,105,689	1940	*
1890	1,166,588	1941	3,495,000
1900	1,765,315	1942	3,344,000
1910	2,000,000	1943	3,743,000
1928	3,155,000	1944	3,921,000
1929	3,165,000	1945	4,543,000
1930	2,505,000	1946	4,381,000
1931	2,415,000	1947	4,500,000
1932	2,500,000	1948	4,044,000
1933	2,220,000	1949	4,151,000
1934	2,310,000	1950	4,275,000
1935	2,385,000	1951	4,705,000

* Data not compiled by U. S. Department of Agriculture for three years.
Source: Phillips, E. F., "The Status of Agriculture in the United States", Miscellaneous Papers in Agriculture, United States Department of Agriculture, Bureau of Entomology, Bulletin 75, Jan. 25, 1909, page 62.

No accurate production records exist prior to the year 1840. In that year, however, some 628,000 pounds were listed as our country's total production. By 1860, this production had jumped to 1,322,787 pounds, the highest recorded figure for any year prior to 1900. Doubtless war usages and a growing industrialization account for this year of peak production.

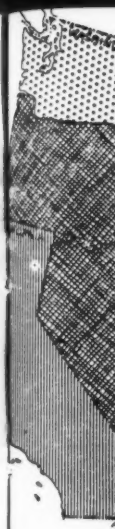
The production of beeswax grew steadily until 1929, reaching, in that year, a total of 3,165,000. Then came the depression of the 1930's, which was reflected in a decline of beeswax production to a low of 2,220,000 pounds in 1933. Gradually the industry gained impetus following its cyclical reverses until by 1939 it reached a level of 2,775,000 pounds.

Stimulated by aircraft and other defense usages, beeswax production during the war years of the 1940's reached a total, in the last year of the war, of some 4½ million pounds. The post war demand for wax continued high under inspiration of conversion and general prosperity. Production has exceeded four million pounds in every year up to and including 1950. Shortly after this, defense demands began to accumulate under impetus of the Korean war and evidence indicates that total production may soon reach new highs.

Beeswax Production by States

Beeswax production has been scattered throughout all the states of the Union. Table III shows the production distribution for the years 1941 through 1949. Utilizing these figures for the map, it is apparent that five states, namely Ohio, Iowa, Minnesota, Texas, and California are the largest producers of beeswax, representing about 40 per cent of the total production for 1949. Eight other states, Illinois, Indiana, Michigan, Wisconsin, Idaho, Florida, New York, and Pennsylvania, collectively, produce another 30 per cent, so that 70 per cent of the volume in 1949 was produced by only 13 of the 48 states.

A breakdown of each state's share of the industry shows that Minnesota was the largest producer, followed closely by California. Accurate data has not been maintained over an extended period, but figures dating back to 1941 reveal that these two states have consistently lead the others.



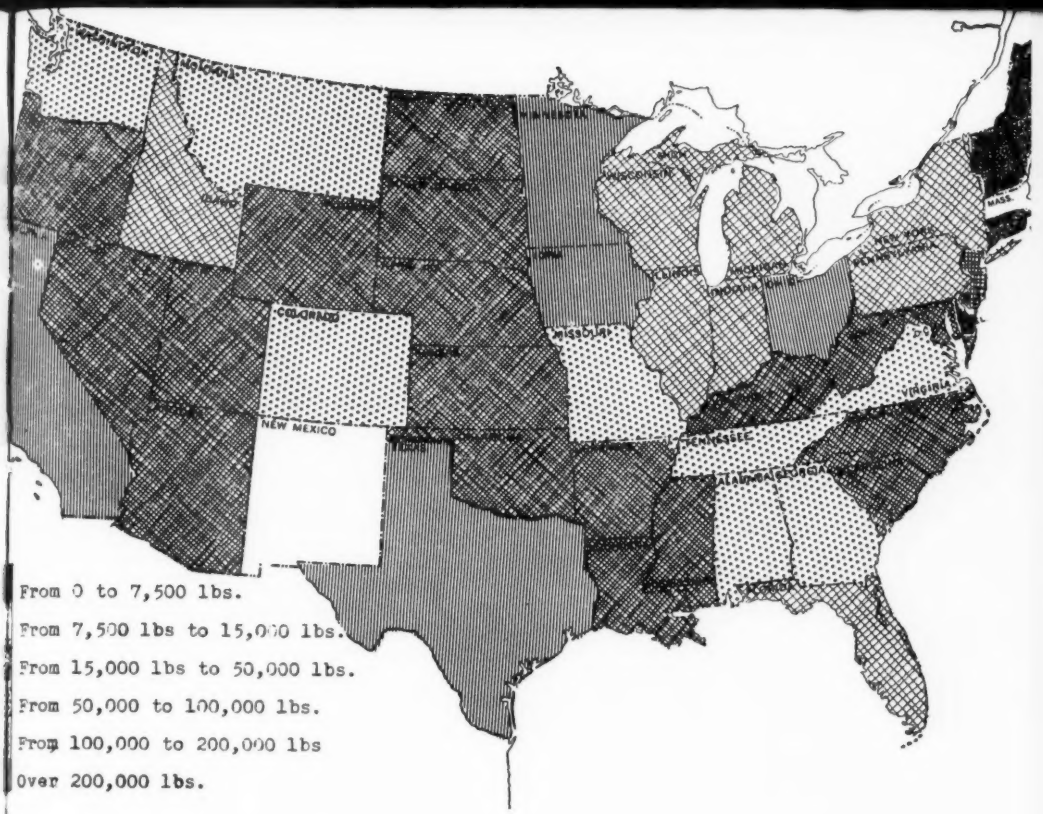


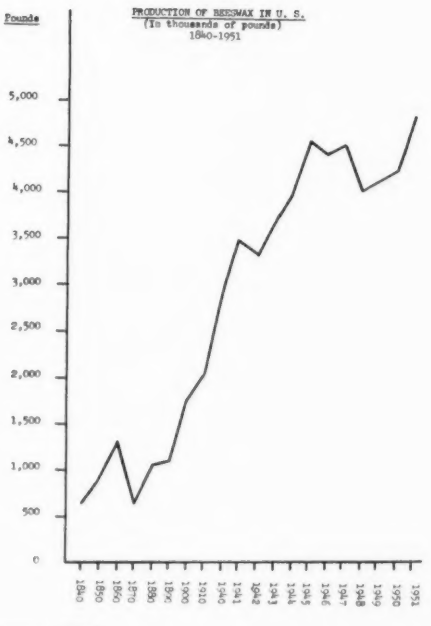
Table II

AVERAGE PRICE PER POUND OF BEESWAX DURING PERIOD 1940-1950

Year	Cents	Year	Cents
1940	22.5	1945	41.3
1941	35.6	1946	44.4
1942	40.3	1947	43.8
1943	41.4	1948	43.2
1944	41.5	1949	37.6
		1950	42.8

FIGURE I

PRODUCTION OF BEESWAX IN U. S.
(In thousands of pounds)
1840-1951



Source: Table I, p. 7

Prices

For many years prior to World War 1, beeswax in the United States remained fairly uniform in price, staying close to about 30c a pound. However, during World War 1, the price climbed to 40c, and eventually to 42c a pound in the fall of 1919 and spring of 1920. This higher than normal price was followed by lower prices in the succeeding year.

As was true of many commodities, the price of wax dropped to below 20c after 1920, with occasional lots being offered as low as 15c. This situation was changed gradually, and the price returned to about 30c in 1924.

In World War II, the government established a price ceiling effective No-

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Table III

BEESWAX VOLUME BY STATES IN THE UNITED STATES

(In thousands of pounds)

State	1941	1942	1943	1944	1945	1946	1947	1948	1949
Maine	1	2	3	3	4	3	3	3	4
N. H.	2	2	2	1	2	3	3	3	4
Vt.	4	7	7	5	5	5	5	5	6
Mass.	10	8	13	8	17	13	13	12	11
R. I.	*	1	1	1	*	*	*	*	*
Conn.	14	18	12	13	8	9	9	8	7
N. Y.	167	141	194	160	177	110	113	102	151
N. J.	24	10	16	12	17	21	22	19	24
Pa.	136	74	138	141	149	101	103	93	103
Ohio	243	145	161	212	188	191	196	176	234
Ind.	209	94	94	124	154	225	231	207	118
Ill.	180	112	119	104	149	139	143	128	129
Mich.	183	142	165	155	178	139	143	128	165
Wis.	141	122	171	160	212	141	145	130	190
Minn.	236	269	277	311	430	352	362	325	445
Iowa	238	211	207	277	589	429	441	396	306
Mo.	69	46	58	69	111	126	129	116	81
N. Dak.	24	30	18	16	50	27	28	25	21
S. Dak.	22	33	24	20	19	20	21	18	30
Nebr.	61	108	78	86	100	99	102	91	46
Kans.	28	26	28	32	52	67	69	62	43
Del.	1	1	1	1	2	2	2	2	2
Md.	6	7	9	11	20	22	23	20	21
Va.	44	46	48	60	26	41	42	38	51
W. Va.	22	19	24	43	30	34	33	30	38
N. C.	62	82	73	90	51	60	62	55	37
S. C.	16	25	21	16	18	19	20	18	15
Ga.	41	75	69	113	88	117	120	108	70
Fla.	135	140	197	196	173	290	298	268	170
Ky.	20	25	20	43	73	83	85	77	44
Tenn.	66	44	56	51	69	49	50	45	74
Ala.	47	46	59	54	72	69	71	64	95
Miss.	24	17	22	22	34	40	41	37	28
Ark.	23	24	25	30	48	53	54	49	35
La.	24	19	32	42	39	30	31	28	32
Okla.	22	20	22	36	42	38	39	35	35
Tex.	76	92	150	151	137	218	224	201	254
Mont.	87	104	90	102	87	69	71	64	61
Idaho	117	157	186	123	172	164	168	151	189
Wyo.	46	58	50	55	53	34	35	31	50
Colo.	96	101	106	131	109	90	92	83	83
New Mex.	9	14	18	12	21	11	11	10	14
Ariz.	99	93	80	83	41	48	49	44	49
Utah	26	49	51	48	57	25	26	23	49
Nevada	6	16	8	16	15	13	13	12	16
Wash.	25	33	45	55	63	78	80	73	81
Oregon	38	39	43	49	56	44	46	42	46
Calif.	325	397	452	378	336	420	431	388	394
U. S.	3,495	3,344	3,743	3,921	4,543	4,381	4,500	4,044	4,151

* Less than 500 pounds.

Source: U. S. Department of Agriculture, Bureau of Agricultural Economics, Div. of Statistical and Historical Research.

vember 13, 1941, at 41½c.[1] This restriction continued until the spring of 1946 when it was released. It can be easily seen from Table II that immediately the price moved upward, and has remained above the ceiling since that time. It is expected that prices of beeswax will rise in answer to new defense demands. In fact, the 1950 price is about 14 per cent ahead of 1949, thus indicating the expected movement upward.[2]

[1] "Ceilings on Beeswax", American Bee Journal (December, 1941), pp. 511-512.

[2] "1950 Honey and Beeswax Production", American Bee Journal (Apr., 1951), p. 154.

New N. Y. Bee Association Formed

AT A RECENT meeting at the Farm Bureau Building, Rochester, New York, of Monroe County beekeepers, the Monroe County Beekeepers was organized.

The executive committee of the organization will be active at all times. Its members are Mr. Andrew J. Miller, Henrietta; Mr. Ralph Clifford, Webster; Mr. Edward Dowden, Brockport and the organization officers, Mr. C. J. Alling, President, 39 Paige St. 11, and Henry D. Masterson, Secretary-Treasurer, 73 Nichols St. 9, both of Rochester, New York.

Lake Drummond and the Dismal Swamp

GEORGE H. REA, Reynoldsville, Pa.

A celebrated breeder accompanies the author in search of a new location for queen and package bee production

THE LATE Mel Prichard, then a famous queen breeder with The A. I. Root Campany, Medina, Ohio, and I journeyed into the wilds of that part of the great Dismal Swamp from Portsmouth, Virginia, to Elizabeth City, North Carolina. The purpose was to find a suitable location in which to produce queens and package bees for the northern market.

Our first stop was at Washington to learn something of the nature of the swamp and its possible honey plant locations as well as something about living conditions and travel.

At the Bee Culture Laboratory of the United States Bureau of Entomology at Chevy Chase, Washington, D. C., Dr. E. F. Phillips then in charge, was enthusiastic about our trip and the beekeeping information we might bring out of the swamp. He had little information for us but went with us to visit several men in the Department of Agriculture and the Bureau of Entomology.

What we learned was helpful but, after all, the only means of transportation was by the Norfolk and Southern Railway near the coast or the inland canal, locally called the George Washington Canal, and some very poor roads in the drier parts of the swamp. We were told also that the brown brackish water of the swamp was fit for use without boiling excepting near dwellings and that we were likely to find living conditions generally far below what we were used to.

Before leaving Washington, Dr. Phillips thought it might be advisable to visit Dr. David Fairchild head of the Bureau of Plant Industry. We found him a delightful person and much interested in our project. Because Phillips wanted us to bring back a list of as many nectar-producing trees and shrubs as possible, Fairchild added that he would like botanical specimens of these and as many others as we thought might be of interest. He outfitted us with a large canvas bag in which to carry the material.

Lake Drummond was wonderful in the wildness of its primitive dress. Our guide had tried to tell us how beautiful it was, but when the flat-bottom boat emerged from the outlet where our vision had been hindered by the tangle of vines and branches overhead we were not prepared to grasp the immensity of the scene before us. The great expanse of brown water lay calm and undisturbed except where some water foul were moving away from our side of the lake. It appeared to be about three or four miles across and almost round. A dense wall of giant cypress and smaller trees crowded its banks and down into the water. Blankets of Spanish moss and mats of vines hung from the trees and almost hid them from view in many places. Obscure openings in the wall indicated outlets where water moved slowly away into the Great Dismal Swamp.

This lake is fed by a constant flow of water from subterranean depths. Our guide told us that fish were not plentiful and only a few small ones were seen. An occasional water moccasin was seen basking in the sun on a tree root or log. Song birds and water fowl were not visibly plentiful but there might have been many hiding from view in the dense covering. The late summer

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season might have had something to do with the scarcity of birds.

Here and there a great cypress tree stood out in the water away from its fellows in magnificent beauty. They stood like gigantic sentinels guarding their world of primitive beauty and grandeur.

We returned to Jennings Landing by the same narrow and shallow outlet by which we found the lake. Both poles and oars were used, as needed, to make progress through shallow places and among vines and tree branches hanging down to the water in some places. Wild muscadine grapes were ripe and we enjoyed eating them where they could be reached from the boat.

For several days we made short trips, wherever we could find a trail that cou'd be traveled safely and not get lost, to estimate the value of the native trees and plants for use to the bees and to collect samples to carry back to Washington. Mel Pritchard returned home from there while I traveled by slow stages on the canal boats as far as Elizabeth City. I enjoyed the generous hospitality of the swamp dwellers with whom I stayed over nights. It was more likely to be a two-room log house, the spaces between the logs chinked with mud. A fireplace sometimes used for both heating and cooking while in others there was a stove; the chimney outside the house made of mud with a framework of sticks to hold it together; the food mostly p o r k, corn bread, hoecake, and molasses. Sometimes there would be collards or turnips or peas of some kind. The furniture and utensils were few and simple and the bed often pine straw.

They would have lots of questions to ask the stranger from outside, and the evenings passed pleasantly as we sat by the light of an oak log burning in the fireplace. And then at night there were the strange sounds of the swamp lands; especially the wild triumphant hoot of the great horned owl, the tremulous plaint of the "shivverin' owl" and the occasional scream of a wildcat. These folks seemed to know how to enjoy life without hurry or anxiety.

In proof of their hospitality I had this experience: I had walked a long distance that day along the canal bank. It was late afternoon and I wanted to reach a village a few miles beyond that someone had t o l d me about. Where a trail led away from the canal I saw a man chopping wood near his log house. I walked over to greet him and ask about how far it was to the village. As usual there were questions about who I was and what I was doing. After I told him he showed me some log gums in which he kept bees and then asked me to stay over night in his home. When I told him that I really should go on at least as far as the village he actually looked hurt and said, "Ain't we good enough for you?"

The chief purpose of this trip was to find out something of the possibilities of the Dismal Swamp for producing package bees and queens for early shipment to northern states. I found several places near the canal where transportation would not be too difficult and where I believed the nectar and pollen-bearing plants and trees were sufficient for the purpose.

After reaching Elizabeth City by canal boat and walking, I returned to Washington to report and deliver the canvas bag crowded with plant samples. Mr. Fairchild was pleased and said that he had never received so many from the Dismal Swamp. While looking them over in the presence of Dr. E. F. Phillips and myself, he suddenly paused and pointing to one exclaimed,

"How long have you carried that one?"

I told him I thought about two weeks.

"And you haven't been sick?"

I told him that I had not been sick and asked, "Why?"

He replied that it was a branch of **rhus venimosa,** the most poisonous of all that family, commonly known in this country as sumac. He called a j a n i t o r, painstakingly wrapped the branch in paper without allowing it to touch his skin, and told the janitor to burn it in the furnace.

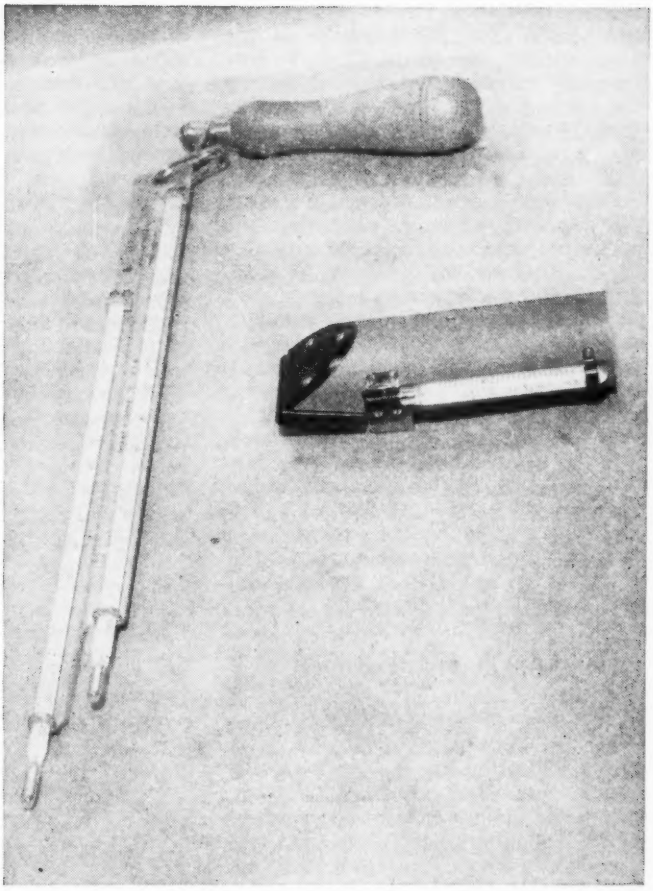
I then recalled that a man who went with me on one occasion warned that the tall shrub was the "bow bush" and it would kill me if I touched it. He had a friend who had died after touching it. Mr. Fairchild said that his story was probably true. Since I broke the branch off with my bare hands, I concluded that my guardian angel must have been hovering near on that day.

The weather and nectar secretion

R. W. SHUEL,

Dept. of Apiculture
Ontario Agri. College
Guelph

Part II



Here are instruments to measure the climatic and nectar-secreting conditions. Left, sling psychrometer; right, refractometer.—Photo by Walter Barth.

WITH THIS background (page 654 November issue) we can proceed to evaluate the effect of various weather factors on nectar secretion in terms of their action on the plant. Weather conditions during early plant growth, as well as in the flowering period, are important. Other considerations being equal, healthy vigorous plants which can synthesize large amounts of sugar are capable of producing more nectar than undersized plants. Weather conditions which promote good vegetative growth prior to flowering, then, should set the stage for high nectar yields. Conditions which favor a high sugar level in the plant during flowering should be beneficial.

It should be emphasized that weather is a complex of factors of which no one can be considered without some reference to others. The most favorable level of rainfall, for instance, will depend in part on soil type. The best temperature will depend on the amount of sunshine received.

(References are found on page 656 of the November issue.—Ed.)

Sunlight

The number of hours of light in the day during the growing season determines whether a plant will flower in the spring, midsummer, or late summer (4). The length of the daylight period, which is dependent on latitude

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and season, and the intensity of the light reaching the plant, which is governed by the same factors and also by the amount of moisture in the atmosphere, together are important in determining how much sugar the plant can synthesize.

Although light requirement varies with species, it is probable that the maximum amount of sunlight available in the summer is the best for both growth and nectar secretion in most of our important honey plants, provided sufficient water is available in the soil. Good hive gains have been found to coincide with periods of sunny weather (5, 7, 8). Shuel (16) found a highly significant correlation between nectar yield in red clover and the amount of sunlight reaching the plant on the day previous. Pedersen (13) found a progressive daily increase in nectar yield in alfalfa in sunny weather following a cloudy period. There is no doubt that sunlight is an important factor in nectar production.

Precipitation

In the agricultural regions of the world, lack of water probably limits plant growth more than any other factor. The important quantity is, of course, the amount of water in the soil which the plant is able to use, and this will depend on precipitation and condensation (rain, snow, dew, etc.), runoff and drainage, soil type, plant species, and other factors.

In hot weather, when plants lose large amounts of water by transpiration through the stomates, a deficit of water in the soil often causes wilting and stomatal closure. When this happens, sugar synthesis is reduced and growth is slowed down. If a prolonged drought exists during the growing season plants will be undersized, will flower poorly, and will not be capable of high nectar production. If a water shortage occurs during flowering, nectar secretion will be limited by a lack of sugar.

Kenoyer (9) found that, in general, good honey years in Iowa were years of more than average rainfall. Moffett and Parker (12), in Kansas, found an association between good honey crops and heavy precipitation in the previous winter months. It is probable that under Kansas conditions a poor water supply in the spring following a winter of flow precipitation has a detrimental effect on growth of honey plants.

It has often been noticed that a rain in the midst of the honey flow may be followed within a few days by improved hive gains.

Influence of Soil Factors

In a study of the influence of soil factors on nectar secretion in snapdragon it was found that yield of nectar dropped when soil water level fell much below the optimum (18).

The most favorable level of precipitation varies with the soil type. In heavy soils too much rain during the growing season hinders growth by reducing the supply of oxygen to the roots. Johnson (6) has noted that white clover in New Zealand secretes more nectar on sandy soil than on clay soil in years of heavy rainfall. This is probably a case of reduced root aeration, at least in part. Too much rain during flowering reduces the honey crop both by depressing photosynthesis and by confining bees to the hive.

Temperature

Temperature has a profound influence on growth of plants. As mentioned earlier, high temperatures combined with a poor water supply cause a slowing down of growth. On the other hand, spring temperatures in Ontario are often too low for the best growth.

The date of the beginning of flowering of some crops grown in this province may vary by as much as two or three weeks in accordance with the temperature pattern (4). This variation will obviously have some bearing on the potential size of the honey crop. Unfortunately, we have at present very litt'e information as to either the exact effect of the temperature pattern on plant growth or the relationship of the time of the honey flow to the size of the honey crop.

Temperature may also affect the size and number of flowers produced. It has been found (14) that a night temperature of 55°F. during the early part of the season leads to a better flower cluster formation in some strains of alfalfa than higher temperatures. Night temperatures around 75° cause flowers to drop.

In general, an alternation of high day temperatures with fairly low night tem-

peratures is most favorable for plant growth. The best temperature range will differ with species. Unusually high night temperatures cause foods which would otherwise be available for growth to be consumed in respiration and lost to the plant. Roughly twice as much food, for instance, is used in respiration at 78° as at 60°F.

Theoretically, the same temperature pattern during flowering should favor abundant secretion. Although this has not been proven by experiment, several observers have noted an association of good hive gains with this type of temperature pattern (11, 12). On the other hand, night temperatures may sometimes fall too low for nectar secretion to take place in some species. Night temperatures in the mid-forties are not uncommon in Ontario even in July, and such temperatures may affect secretion adversely.

Threshold temperatures below which secretion does not occur have not been worked out for most plants, but are known for a few (8, 20). Here again we should expect to find considerable variation with species.

Humidity

The influence of atmospheric humidity on secretion has not been clearly established. Under field conditions humidity and temperature effects are hard to separate, and under experimental conditions humidity control is extremely difficult to achieve. When humidity is high nectar volume is high and nectar concentration relatively low, due to the slowness of water evaporation from the nectar. Large volumes of dilute nectar are of no advantage to the honeybee except in a few plants like red clover where the bee has difficulty in reaching the nectar.

At present there is no evidence that extremes of humidity are either favorable or detrimental to the secretion of large amounts of sugar.

Wind

It is unlikely that wind has any direct effect on secretion. It does, however, influence plant growth by regulating the rate of evaporation of water from plant and soil. Warm dry winds will also hasten the concentration of nectar by evaporation.

Altitude

Altitude is of course a topographic rather than a weather factor. Variation in nectar secretion with altitude does, however, afford an interesting example of how a certain type of plant growth, conditioned by the interaction of weather factors, may influence secretion.

Ernest Tschudin (19) has listed average honey yields at various altitudes in the French Pyrenees. The average production of 20,000 colonies below 1,000 feet was 6.6 pounds. With increasing elevation it rose steadily to 19.8 pounds between 4,000 and 5,000 feet.

The most striking features of the weather at the higher altitudes are intense sunlight and low night temperatures. Plants, as a result, are stunted in their vegetative growth but produce an abundance of flowers. Evidently severe limitations on growth allow sugars to accumulate so that nectar is secreted copiously. These observations provide further evidence in support of the theory of the importance to secretion of a high sugar level.

The Influence of Weather on Nectar Concentration

Where many nectar plants are flowering concurrently, the sugar concentration in the nectar may determine the bee's choice of plant. Agthe (1) has shown that the concentration at which nectar is secreted is dependent on the anatomy of the plant. In species carefully examined this concentration appears to be quite low (1, 17).

On exposure to conditions of high temperatures and low humidity, water is rapidly evaporated and the nectar becomes more concentrated. Increases in concentration from 20 per cent to 60 or 70 per cent in two days have been observed in snapdragon (17).

The effect of weather on nectar concentration will be most pronounced when the nectar is poorly protected, as in blossoms of pear, apple, cherry, or fireweed (15).

The Influence of the Weather During the Previous Year

As many of our important honey plants are biennials (red clover, alsike, dandelion, blue weed) or perennials (alfalfa, basswood, fireweed, milkweed,

(Continued on page 756)

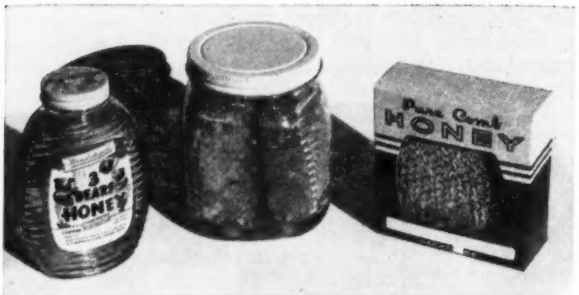
XUM

Temperature and time are factors that seriously affect honey.

Nature of honey – its care in processing and storage

VERN G. MILUM, University of Illinois

Part III



Regardless of the type of honey, it is important for beekeepers to know the nature of their product if it is to be placed on the market in prime condition.—Photo by John W. Buchanan.

NOW THAT some of the basic factors in honey granulation have been listed and examined, it is evident that much of the actual control of granulation is based upon the nature of the particular honey and its care up to the time of actual preparation for marketing. With practically all honeys it is evident that some treatment is necessary to retard natural granulation and thus keep extracted honey in its original liquid state and free from crystals, at least, those that are visible without microscopic examination. The general suggestion is usually made that to prevent crystallization of honey, it should be heated to 160°F. for 30 minutes.

In speaking before the Federation meeting in Chicago in January, I posed a query as to the origin or authority of 160°F. My copies of "ABC and XYZ of Bee Culture" for 1880 to 1891, reveal nothing other than in the latter, a system for ripening honey by passing over 100 feet of warm water in trays. In the 1901 edition, 160°F. is given as the temperature to raise honey in a vat and maintain until all is liquid in order to prevent candying. This temperature was suggested as the upper limit since color is darkened and the flavor marred only slightly. A storage temperature of 70°F. was suggested. From these earlier editions 160°F. seems to have been maintained, and like Topsy has just grown.

Although 130°F. for 30 minutes is sufficient to control fermentation, for most samples a somewhat higher temperature is necessary to prevent crystallization. While 160°F. for 30 minutes is the most commonly stated temperature and time combination, a lesser temperature and a longer time interval as well as a higher temperature and a shorter time interval will satisfactorily control granulation. Actually honeys high in levulose require less than 160° F. or a shorter time interval. An exact statement for any given or particular honey cannot be given, although with a chemical analysis and a large series of tests, a definite time-temperature factor table in relation to the water content versus the L/D ratio might be established.

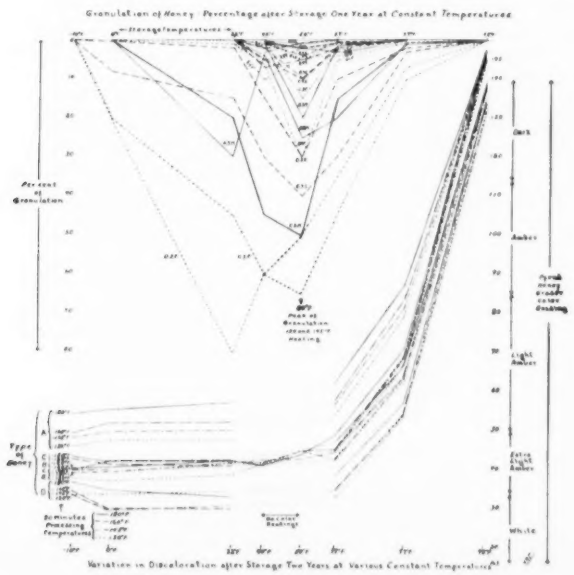
Heating honeys to 160°F. for 30 minutes may mar the flavor slightly and darken the honey somewhat, but the important thing is to cool the honey rapidly after heating. Higher temperatures even up to 200°F. may be used without damage to the honey, provided a rapid system of cooling is employed. In fact it is the maintenance of temperature even down to 70° F. for long periods of time that does the actual damage to color and flavor. But after honey is heated, it should be strained while hot and bottled and capped, then cooled rapidly. In fact, when honey is heated it should not be cooled before bottling for then there is danger of contamination with dextrose crystals which may serve as nuclei for granulation, or with yeasts to cause fermentation.

While the previous portion of this article has dealt with the factors affecting granulation of honey and the steps in the elimination of granulation to present a liquid product to the customer, some consideration should be given to the production of honey to be sold in the actual granulated form.

When honeys granulate naturally and quickly with the formation of very fine crystals, a creamy consistency results and the product is often called "creamed honey", "cream of honey", "honey-creme", "candied honey", or "spun honey" which vary somewhat in their methods of preparation. These various forms of granulated honey should not be confused with "Honey Cream" which is a mixture of extracted honey, previously heated to melt all crystals and to destroy yeasts (to prevent fermentation) and enzymes (to avoid rancidity), mixed hot in the proportion of 42 per cent honey with 58 per cent high-test cream (75 to 80 per cent butter fat). This product, which was developed by Professor Tracy of the University of Illinois, has met with favor by most consumers but has the disadvantage that it must be stored at refrigeration temperatures and not for extended periods.

In some countries, such as Canada, marketing of honey in the granulated form has long been and is still the common practice. In the 1880 edition of "ABC and XYZ of Bee Culture", it is suggested that the liquid portion be drained from granulated honey before selling the latter. Although granulated honey has been marketed in the United States in insignificant quantitites since 1880, possibly before, it is only within comparative!y recent years that any concerted attempt has been made to market it as "**creamed honey**". Customers had learned to demand honey in the liquid form.

(Continued on page 757)


Granulation of Honey - Percentage after Storage One Year at Constant Temperatures
Storage Temperatures
Percent of Granulation
Dark
Amber
Light Amber
Extra Light Amber
White
Variation in Discoloration after Storage Two Years at Various Constant Temperatures

XUM

Editorials

Yule-Tide Greetings to All

AS THE Christmas season approaches, our minds naturally turn to home, loved ones, and friends. Christmas is the time for giving, rather than getting; a time for renewing our hopes and asperations for the future.

We are hopeful for the future of our industry, and as one of our leaders has well said, we may be on the threshold of a new era in beekeeping. With this in mind the entire Gleanings staff wish you one and all a Very Merry Christmas and a Happy New Year.

Bees in Most Areas Have Ample Winter Stores

IN REVIEWING the semi-monthly honey report as of October 17, 1955, published by the U. S. Department of Agriculture, it would appear that colonies of bees in most sections of the country are s t r o n g and well supplied with winter stores. In some areas the lack of moisture retarded the progress of colonies and reduced the amount of summer honey stored. However, in most of these areas, late summer and early fall rains came in time to revive honey plants and bees have stocked their brood chambers well for winter. It is remarkable how honey plants will respond to needed moisture.

Throughout the clover area the fall rains have put clovers in excellent condition, and barring unfavorable weather conditions between now and the time the surplus crop is harvested next season, beekeepers should be favored with a good crop. Of course, many things can happen in the meantime to change the picture.

It is fortunate in most sections of the country that fall sources of nectar which stimulate brood rearing to develop populous colonies, also furnish an adequate amount of winter stores. In some scattered areas, the drought which prevai'ed during the summer continued into the fall months and this condition reduced the amount of honey secured. However, in most areas the fall flow has been quite good, this being due to adequate moisture. Since there is a healthy demand for honey at the present time, it would seem that beekeepers over the country should make an effort to produce more honey in order to meet the growing demand for it.

As a matter of fact, there should be more honey produced than there has been during recent years. The per capita consumption, about one and one half pounds per person, should surely be increased.

Let us hope then that the colonies of bees over the country that now have an adequate amount of stores and are very popu'ous may winter well and that the honey crop in 1956 may be much greater than the crop harvested in 1955.

Advancing Honey Prices May Cause Bakers to Look for Other Sweets

THE ADVANCE in honey prices that has occurred recently may have a tendency to cause bakers who have been using honey in their products, to look for other sweets as substitutes for honey. At present much of the amber and dark honeys

are absorbed by the bakery trade and if this outlet for the darker honeys should be cut off, our industry would suffer.

It costs money to produce honey these days. Labor and material are high. The beekeeper is entitled to at least a fair margin of profit for his product. One trouble with our industry during recent years has been that the price of honey has not been high enough to give the beekeeper the margin of profit to which he is entitled.

It is to be hoped, however, that the price asked for dark honey going into the bakery trade may not advance to a point where it would cause bakers to substitute other sweets.

The National Meeting at Biloxi, Mississippi

IT IS IMPORTANT that beekeepers over the country get together at least once a year at the National meeting to become better acquainted, also to enjoy a program consisting of talks by leaders of our industry, as well as panel discussions concerning problems which face beekeepers at the present time.

The meeting place, Biloxi, Mississippi, is situated on the Gulf of Mexico, and a beautiful spot to visit. The weather during the month of January is usually mild. Beekeepers, especially those in the North, should plan to get away from some of the snow and ice for a week or so to bask in the southern sunshine.

At the Southern Conference meeting in Asheville, North Carolina, held recently, one of the prominent speakers stated that in his opinion the beekeeping industry is on the threshold of a new era. If this is so, and we rather think it is, beekeepers and those connected with our industry should surely attend the National Federation meeting in Biloxi, Mississippi, **January 23rd to 26th, 1956** at the Buena Vista Hotel.

Functions of a Bee Journal

WHEN THE LATE A. I. Root, then a jeweler, secured his first swarm of bees in 1865, he did not realize that later on he would be editing a bee journal.

Even though the swarm was captured in late August, Mr. Root succeeded in wintering it successfully, with the help of some farmer beekeepers in the vicinity. His unbounded enthusiasm for bees was so contagious that some others in the community took up beekeeping. His fame as a beekeeper and a builder of hives and bee appliances spread rapidly beyond the confines of his community.

As time went on he was so deluged with questions concerning beekeeping that he decided to start a journal to help him answer some of the questions, the first issue appearing in January, 1873.

And so, Gleanings was created to help beekeepers succeed and to disseminate information on methods of keeping bees successfully. It would seem that this is still the most important function of a bee journal.

As our industry has advanced, another function of a bee journal has been to publish the latest scientific information on honey, wax, and other products of the hive. This means cooperating with colleges and universities where beekeeping is taught and where experimental work on bees and their products is conducted.

It is essential that beekeepers over the country have the latest information on the honey market so that the prices they ask may be on the proper level. The editor of a bee journal must keep in close touch with marketing trends.

Still another function of a bee journal is to furnish a suitable advertising medium for the sale of honey, wax, bee supplies, also package bees and queens.

A bee journal can be of help to beekeepers everywhere by cooperating with beekeepers' associations in promoting national, state, and county bee meetings. Such meetings are of value to our industry in that beekeepers have the opportunity of hearing speakers who are qualified to give helpful information on various phases of beekeeping. Beekeepers attending such meetings have an opportunity to exchange opinions and experiences.

It would seem then that the chief function of a bee journal is to help disseminate useful information on producing and marketing the products of the hive and to help coordinate the different sectors of our industry so that it may steadily advance. Gleanings has endeavored to perform these functions during the years and we hope to continue doing so in the years to come.

XUM

A Christmas Message from the American Honey Institute

"JOY TO THE WORLD!" exalts the Christmas hymn. We echo its bouyant phrases.

How could we do better than to wish you joy at Christmastime, that peculiar joy that comes so fully to those who open their hearts to the glad message of the holy birth?

The joys of Christmas are not the material ones of pretty presents and decorative dinners. They are not even the quasi-religious joys you get from the holiday sense of family well-being and unity.

But Christmas joy is your real understanding of Christian living, as it is revealed to you through the beauty of the Christmas birth and lived by you throughout the entire year.

A sage of our times, we don't remember who, has defined this holiday joy in a few well chosen and wise words. "Joy", he tells us, "comes only to those of you who remember that **J**esus is first, **O**thers are second, and **Y**ourself is last."

Jesus first,
Others second,
Yourself last.

How simple a slogan by which to mold such a rich life! For rich indeed is the person who can pattern his daily behavior after this simple code of conduct. Yet follow it you shall, if you want to realize the true joys of Christianity.

Yes, Joy to the World. And especially—joy to you and your loved ones.

Harriett M. Grace

Live and Learn

by Propolis Pete

NOTHING MUCH to do with the bees this month. It's too late to pack and too late for work. Nothing is left in the fields for them and the only blooms visible are the chrysanthemums in the gardens of the neighbors. So, we go into our annual hibernation to wait for next year.

The first thing my bees work on in the spring is the elm. I don't know how much longer that will be possible. Between the Dutch elm beetle and the State Highway Department, they are doing a pretty good job of getting rid of them. It's a darned shame that we can't find the answer to the elm beetle problem. It will come in time, but not in time to save the trees that have made our Main Street the shady restful thoroughfare that it has been for these many many years. Every time one of them comes down it leaves a hole that a hundred years of new growth will not fill. The main drag is getting to look like the shopping center of one of those "revolting developments" that are springing up all over.

As soon as my honey crop was bottled and on the stands, we took advantage of the lull and hiked off for a look around the country. First we went North and saw a lot of honey country but no bees. Then we came home to pick up the pieces occasioned by our absence, and off we went again, this time South. Saw a lot more honey country and, for a change, bee yards, all kinds of bee yards. Some nice and new looking, and some that surely Noah rejected when he was making his selections for the Ark.

There was another difference. It is entirely possible that up North there were bee yards back off the roads where a passerby in a car could not see them, but if there were bee yards, why didn't they have honey for sale on the roadside stands? Somebody is losing a lot of business some place. In my Southern tour, every souvenir stand and shop had honey in one form or another. And what prices some of them were getting! In one place I saw a regular two pound Queenline jar of nice looking honey, with a fine label and a piece of light blue ribbon around its neck selling for—hold your breath—$1.25. I don't know how many they sold at that price, but that is what it was marked. I thought that I was a greedy old thing for charging 90c for the same pack without the ribbon.

This matter of honey prices is a tricky one. The beekeepers who are giving away their crop just because some cluck down the road is putting out a substance that looks like road oil, packed in a third-hand fruit or coffee jar for a fraction of the real value of a nice clean product, should take another look. Your prices have to be governed to some extent by your competition, but price is not the only consideration.

The chain stores around here sell some honey at low prices. They tell me that the quantity is not very great. I have bought it and find that it is good, but I sell more than they do, and at better prices. It isn't entirely a matter of people coming direct to the producer either. Year before last I started to put my honey on the better road stands around here, and they sell more than I do here at home. I think that it is because they make a specialty of it, and if I do say it myself, it looks good, it stands out for itself instead of being grouped with all kinds of syrups, and people buy it because it is offered.

There are no two situations that are exactly alike. That is where you have to start to use your own noodle. Some people have a flare for selling, but haven't the patience for quality production. Some people are at their best working for mass production, but complete flops when it comes to craftsmanship. Some people are wows when it comes to giving advice, but are pretty poor followers of it. You have to find your own place and fit into it. All kinds have their places, and the one who gets to where he wants to go is the one who finds the right way to get there and sticks to it.

This seems to be developing into quite a sermon, but the fact still remains that if you want to do something badly enough, and think about it hard enough, you will find the answer before very long. Maybe the answer will be to try some other business, and just keep bees for a hobby. But you will find exactly the same conditions in the new business, so why not stay with it and really do something to get what you want.

XUM

Federation to meet on the balmy Gulf

THE AMERICAN Beekeeping Federation Meeting will be held at Biloxi, Miss., in the Buena Vista Hotel, January 23 through 26, 1956. Everyone who is able to make the trek, whether by car, train, airplane, bus or plain old wagon cart, is expected to be present.

This city was founded in 1699 and many historical points of interest beckons to each of you. Why not make this convention trek a vacation? An important part of the picturesque and interesting seafood industry at Biloxi, Miss., on the Gulf of Mexico is boat and ship building. Along the shores of historical Biloxi peninsula, boat building goes on every week of the year. It is here that boats are built of cypress for use in the shrimp and oyster industry. Many of the boat builders are descendants of the French colonizers, who first constructed boats along the shores of Biloxi as far back as 1699.

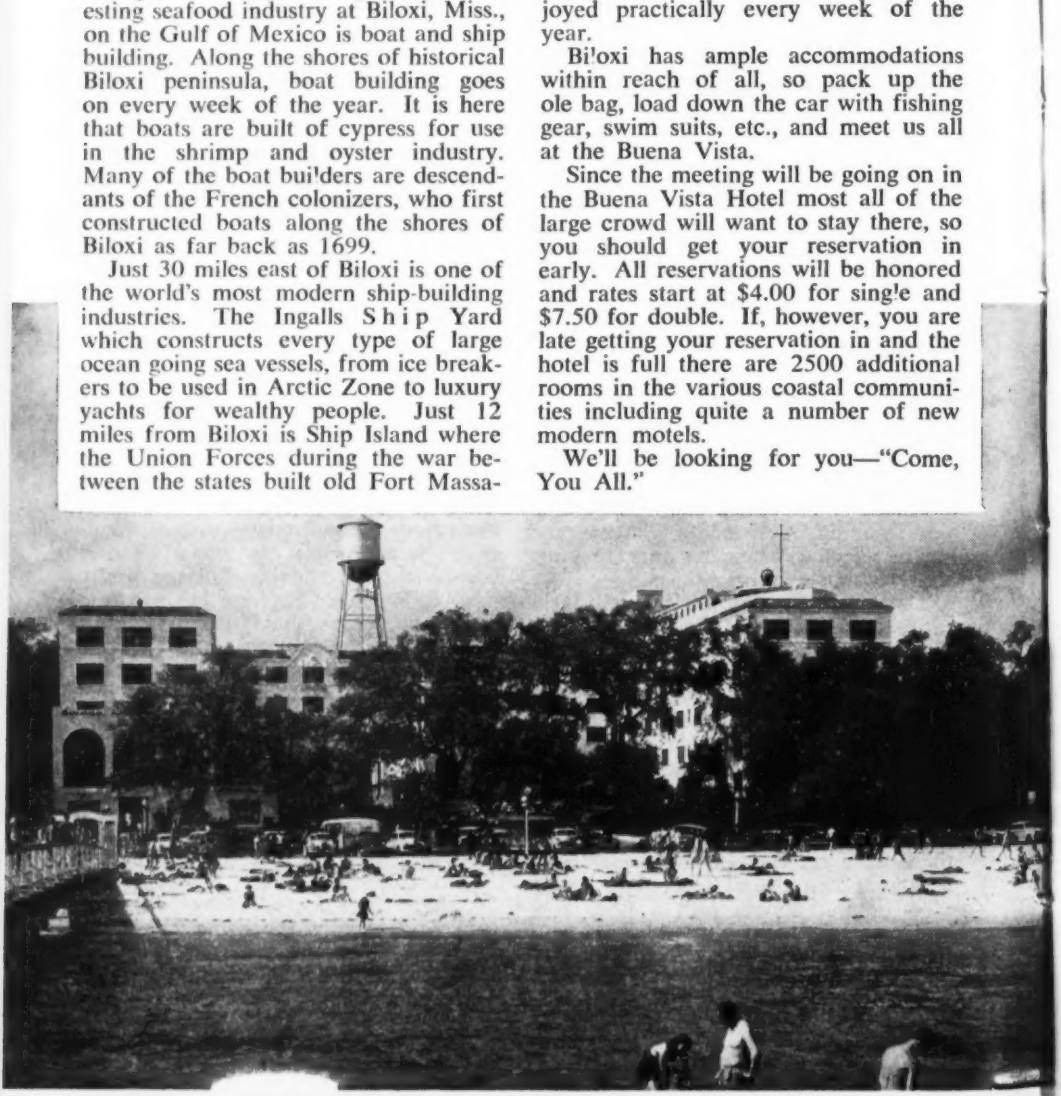
Just 30 miles east of Biloxi is one of the world's most modern ship-building industries. The Ingalls Ship Yard which constructs every type of large ocean going sea vessels, from ice breakers to be used in Arctic Zone to luxury yachts for wealthy people. Just 12 miles from Biloxi is Ship Island where the Union Forces during the war between the states built old Fort Massachusetts. A scheduled ferry takes sightseers out to see it. Deer Island is less than a mile away and in sight of the hotel, also the old famous Church of the Redeemer, an Episcopal Church where Jefferson Davis was a member.

Every week of the year is outdoor week in Biloxi. Golf and boating are among year-round attractions. Fishing goes on all the time whether for fun or profit—truly a fisherman's paradise. Swimming is enjoyed every month except in mid-winter and sun bathing enjoyed practically every week of the year.

Biloxi has ample accommodations within reach of all, so pack up the ole bag, load down the car with fishing gear, swim suits, etc., and meet us all at the Buena Vista.

Since the meeting will be going on in the Buena Vista Hotel most all of the large crowd will want to stay there, so you should get your reservation in early. All reservations will be honored and rates start at $4.00 for single and $7.50 for double. If, however, you are late getting your reservation in and the hotel is full there are 2500 additional rooms in the various coastal communities including quite a number of new modern motels.

We'll be looking for you—"Come, You All."



Bee Facts

(A Digest of Scientific Research)

Edited by Walter Barth

The Electron and the Bee.

THE BRITISH journal COMMUNICATIONS AND ELECTRONICS recently described a new device called an "apidictor", which, according to the report, will enable beekeepers to divine the innermost secrets of his bees.

A British Broadcasting Engineer, E. F. Woods, discovered that the bees reveal their intentions by the sounds they make. A contented hive with no ideas of swarming buzzes along at 180 cycles per second. When the colony gets so crowded that the nurse bees cannot feed the larvae, the frustrated workers add a soft 250-cycle warble to their hum. The Englishman designed a microphone that can be placed in the colony entrance where a selective, battery-powered transistor amplifier analyzes the sound coming from the colony. The warble of the frustrated workers are detected here and a warning is given.

"The apidictor tells other things. A colony with a healthy, functioning queen signals that fact by responding to any sudden stimulus, such as a jar, with a short hiss at around 3,500 cycles per second. A colony being robbed by foreign bees rings an alarm by unusually large variations in the loudness of its basic 180-cycle note."

Scientific American. April 1955. Pg. 54.

Is Honey Good for Cookies?

RESEARCH AT Kansas State College indicates that honey should be favorably accepted by the baking industry for use in the popular varieties of cookies when used at optimum levels. These include replacement of sucrose or invert syrup in amounts of five per cent for sugar cookies and vanilla wafers, 30 per cent for ginger snaps, 13.3 per cent for macaroon chips, 50 per cent for brownies, and 66.6 per cent for fruit bars.

"The color of sugar cookies and vanilla wafers can be improved by the use of honey and all properties of the 'chewy' types of cookies are enhanced by honey. The use of heartsease and buckwheat honeys is not recommended. Tupelo and eucalyptus honeys are regarded to be of questionable value because of their effect on consumer acceptability. All other honeys produced cookies of equal or better character and appearance than did sucrose or invert syrup. Variable properties of honey other than flavor and aroma did not in any way affect the production of cookies."

Smith, Loren A. & John A. Johnson. The Bakers' Digest 27(2):28.31, 1953.

The Swaying Robber Bees:

HAVE YOU ever wondered what caused robber bees to sway in front of the hive entrance of their intended victim? This interesting question apparently caused J. B. Free of the Rothamsted Experimental Station in England to seek the answer.

This swaying flight of robber bees, according to J. B. Free, is an instinctive response to the congestion of bees, of their own or another colony, at the entrance to the hive they are robbing.

"Foragers enter without hesitation, hives other than their own to collect syrup or honey in the absence of a congestion of bees at the entrance, even when these hives contain a colony of bees."

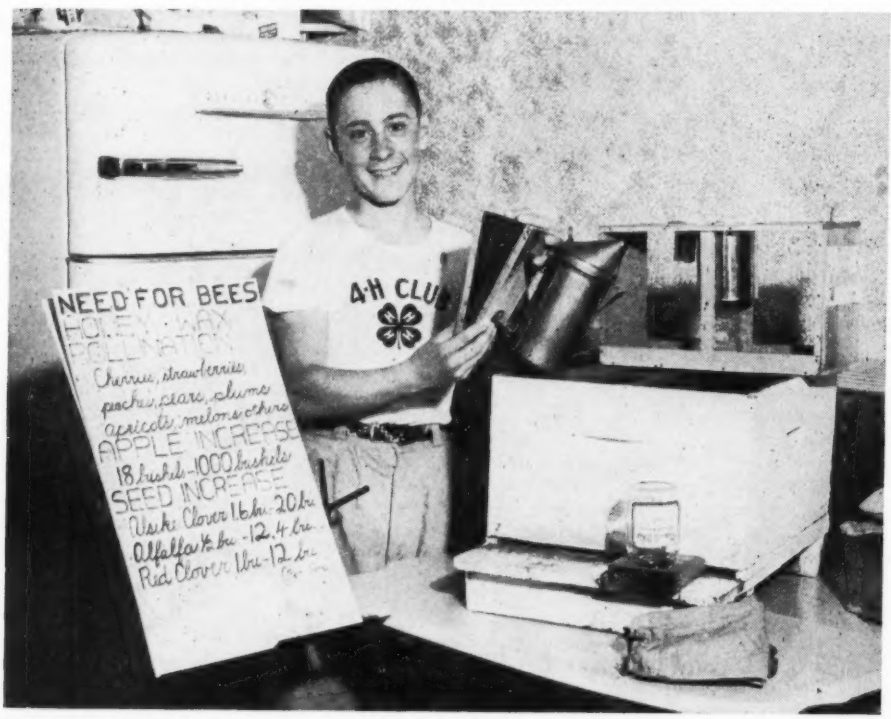
How do guard bees recognize the robbers? The guards can quickly recognize potential robber bees by their flight behavior and then confirm their identity through the odor of the bees.

Free, J. B. The Behavior of Robber Honeybees. Behavior, Vol. VII, 2-3. Pgs. 233-240. 1954.

XUM

News

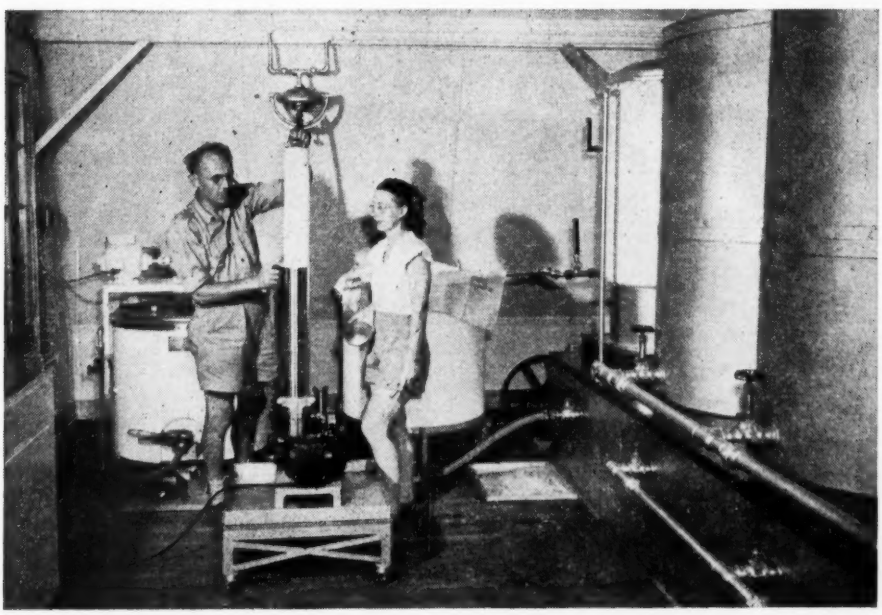
Honey Queen honored. Herman Swisher, Ohio Bee Association prexy presents a special silver cup to Honey Queen, Mrs. Lucille Temple.



Bill Davis, son of Mr. and Mrs. Albert W. Davis, Newton Junction, N. H., took county honors with his beekeeping display.

reel

Washington Bee Picnic. Attending the picnic were, left to right: Mr. Harold Parrish; "Major Domo" of picnic—a big man with a kind heart and a great liking for fried chicken, any style; Mrs. Parrish, Dr. Joe. Brugman, Miss Lewis, Mr. George Hundsdorfer, Mr. Mueller, and Mrs. Brugman.



Canadian Honey House of Mr. and Mrs. K. N. Wells, Coldwater, Ontario, showing their inline strainer. —Photo sent by Dr. E J. Dyce.

XUM

Beekeeping Cross-word Puzzle

CLIFFORD L. JONES, Topeka, Kansas

Down

1. An affliction of bees.
2. Italian, Carniolan and Caucasian bees belong to this grouping.
3. Organ of vision.
4. Invented the first bellows smoker.
5. Great world organization. (abbr.).
6. One or the other.
7. European Theater of Operations (abbr.)
8. Not old.
10. A well-known swimming bird.
14. Lovell says that this tree is a source of pollen and honeydew.
16. A tree producing a honey that rarely granulates.
20. Rodent.
21. Used to subdue bees.
23. Partake of food.
24. Bee supply catalogs advertise some equipment this way.
25. The germ of the bee in the egg.
26. Sun God.
28. One means of bee identification.
34. Possessive neuter pronoun.
35. Maker of an early foundation press.
36. Fruit drink.
37. Finish.
40. Inventor and manufacturer of bee supplies.
42. Before or sooner.
47. Singular.
50. A means of increase in honeybee colonies.
51. Fourth joint of a honeybee's leg.
52. Anger.
53. Neuter pronoun.
54. Raven.
55. Home for bees.
56. Indefinite number or quantity.
60. Slang for father.
61. Units of time.
65. Masculine.
66. Preposition.
67. Same as 27 across.
69. Unit of measure (abbr.)

Across

1. One may use smoke to ..... the bees from a super.
4. Mother of a colony.
9. Beginning of new bee life.
11. German for yes.
12. One may ..... two weak colonies to form a strong one.
13. A pretty view.
15. To pull a load of bees.
16. Highest point on a hive.

17. Long slippery fish.
18. Pronoun.
19. Feminine beekeeper. (abbr.)
22. One who keeps bees.
27. Sign of infinitive.
29. First person of the verb "to be."
30. Apiary location.
31. Personal pronoun.
32. Singular article.
33. Director of Gleanings.
36. Fit.
38. Sometimes ruins hive stands and bottom boards.
39. That which contains beekeeping tools.
41. Male bee.
43. Units of time (abbr.)
44. Electrical engineer (abbr.)
45. What most beekeepers hope to produce
46. Abbreviation of a degree held by some beekeeping specialists.
48. Same as 27 across.
49. Upon.
50. Beekeepers sometimes receive them.
53. A sensation in the skin.
57. Used in some types of foundation.
58. A type of comb honey.
59. Honey should ..... before being taken from the hive.
62. Part of a civil war president's name.
63. Where a bee's egg is produced.
64. Site of the 1956 Eastern Apicultural Society (EAS) Meeting.
65. Used to postpone granulation in honey
68. Plural of I.
70. A tree valuable for pollen and honey in early spring.
71. Unit of weight.
72. Being put to use.

The Two-story Hive is Here to Stay

JULIUS LYSNE, Stockholm, Wisconsin

WE STILL hear some beemen express doubts as to the advisability of giving a colony of bees two hive bodies the year around. They argue that the double-story hive costs more and that the single-story hive will give the beekeeper just as large a crop.

We concede that such may sometimes be the case but only with a lot of extra work. The single brood chamber almost always means feeding in late fall. The feeding must be delayed until November, after the last cycle of brood has emerged.

Also, the bees must be fed again in the spring until a good flow is coming in. This is a lot of extra work and may be well enough for the hobby beekeeper. It certainly is expensive for the commercial beeman who has to hire help.

Some will argue that even the best queen cannot keep more than seven good standard brood combs full of brood at one time and that therefore the single brood chamber is enough. It is perfectly correct that even a good queen cannot utilize more than seven combs but often quite a lot of honey comes in from fruit bloom and dandelion. The single chamber soon is clogged with honey. The single brood chamber advocates' answer to that, of course, is to add a queen excluder and two shallow supers. But the point is, there is no market for dandelion honey. It is bitter and we certainly don't want it mixed with our basswood-clover honey.

What to do? Extract it, of course, and feed it back to the bees if we are to insist on a single-story brood chamber. Again, this is a lot of work and to no purpose. Just adding an extra hive body without an excluder will solve the problem. To make things easier still, leave two hive bodies the year around.

It's An Idea

MILTON H. STRICKER, Annandale, N. J.

THOUGH IT takes time to build the Dr. Miller feeder, it is still the easiest to use. Built of two paraffined compartments, it is easy to fill with sugar, add water (no mixing necessary), surround with an empty super, put on the cover, and let the bees do the work. Guaranteed to help even the weakest of colonies.

XUM

Holiday sweets

MRS. BENJ. NIELSEN
Aurora, Nebraska

Honey nut steamed pudding.
—Photo courtesy Kellogg Co.

EVERY YEAR when activities pile up, time presses, and the days are far too short, I vow I will begin Christmas preparations early, really early next year, so I can avoid that hectic last minute rush. And I never do! After the excitement quiets down it seems such a long time until Christmas is due again, there's plenty of time. So it goes. Then I rush around and love each hectic moment of it!

Honey cookery, praise be, doesn't have to be done the last minute to insure freshness and goodness. That is one of the many nice things about honey. Actually honey-way treats are much improved in flavor goodness if time elapses before the goodies are to be used. Flavors mingle and merge to produce subtle mellow deliciousness. So plan to make cakes, cookies, and other confections ahead of that last minute rush, store them and you will be most pleasantly surprised!

The best of the season's greetings to you and yours!

Honey Chocolate Rounds

Two cups semi-sweet chocolate pieces, ⅔ cup honey, and 5 cups oven-popped rice cereal.

Melt chocolate over hot but not boiling water; stir in honey. Remove from heat. Add rice cereal, mixing thoroughly. Press into buttered 15x10-inch pan. Let harden. Cut into circles with small cookie cutter. Yield: about 30 two-inch rounds.

Crispy Honey Bars

One cup honey, ½ cup heavy cream, 1 tablespoon cocoa, 1 teaspoon vanilla flavoring, and 5 cups oven-popped rice cereal.

Combine honey, cream, and cocoa. Cook over moderate heat to hard ball stage, 254 degrees F. Remove from heat; add vanilla flavoring. Measure rice cereal into buttered large bowl. Add cocoa syrup, stirring briskly until rice is well coated. Press mixture into buttered 9x9-inch pan. When cool cut into bars.

Honey Nut Steamed Pudding

One-half cup shortening, 1 cup honey, ½ cup sugar, 2 eggs, 2½ cups sifted flour, 4 teaspoons baking powder, 1 teaspoon salt, 1 teaspoon cinnamon, ½ teaspoon nutmeg, 1 cup whole bran cereal, 1 cup milk, 2 teaspoons vanilla flavoring, and 1 cup chopped nutmeats.

Cream shortening until light and fluffy; gradually stir in honey and sugar. Add eggs; beat well. Sift together flour, baking powder, salt, cinnamon, and nutmeg; mix with bran. Stir into creamed mixture alternately with milk. Stir in vanilla and nutmeats. Fill greased one-quart molds two-thirds full, cover tightly. Steam 1 hour. Serve hot with orange or other fruit sauce. Serves 12.

Honey Cookies

Two and ¼ cups sifted flour, ¼ teaspoon allspice, ¼ teaspoon cloves, ¼ teaspoon cinnamon, 1 teaspoon soda, ¼ teaspoon salt, ½ cup honey, and ½ cup shortening.

Sift flour with spices, soda, and salt. Melt shortening, add honey and simmer for one minute. Cool. Add sifted dry ingredients. Chill thoroughly in refrigerator. Roll to ⅛-inch thickness and cut with cookie cutter in any desired shape. Bake on greased cookie sheets in moderate oven, 350 degrees F., about 12 minutes. Remove from pan at once. Decorate as desired.

FROM Foreign LANDS

Translated and Edited by Erika Barth

How to Handle Poisoned Bees:

IF YOU suspect that some of your colonies have been poisoned with insecticides, send samples of dead bees to your State Entomologist at the address of your state department of agriculture or to the beekeeping specialist at your state agricultural college. In doing so, here are some suggestions to consider:

1. Send samples for testing without delay, giving the date of poisoning.
2. Never expose bee samples to sun or heat. Keep them in a cool room.
3. 200 or more bees are necessary to make a test practicable.

Zeitschrift fur Bienenforschung. Oct. 1955.

How Old Should Larvae be for Good Queen Rearing?

RESEARCH AT the Zoological Museum in Hamburg, Germany, showed that complete queens can be reared from only the very youngest larvae. No queens were successfully reared from larvae older than three days.

In these tests, Wilhelm Vagt reared queens from larvae of different age without previous contact with the nurse colony. Queens were examined for legs, spermatheca and shape of the head.

Zeitschrift fur Bienenforschung. Oct. 1955. [The late Mel Pritchard, queen breeder for the A. I. Root Company for 30 years did a lot of experimenting along this line and was of the opinion that larvae 18 hours old are preferable to use for grafting into queen cell cups.—Ed.]

Beekeeping History:

SINCE THE publication of the "History of Beekeeping" in earlier issues of Gleanings, there has been a considerable amount of material published. The latest is by H. M. Fraser, a recognized beekeeping historian. We certainly recommend his latest paper called "Beekeeping in the British Isles before 1500" which appears in the October and November 1955 issues of the BEE WORLD.

Bee Venom Therapy:

INSTEAD OF using live bees, the pharmaceutical concern of Heinrich Mack of Illertissen Bavaria, Germany, offers packaged bee venom. This is a standardized poison of live bees for percutaneons application with ultra waves respectively or for intracutaneous application as a wheal. The above illustration was an insert in the Deut. Med. Wschr. (80. Jan. 28, 1955).

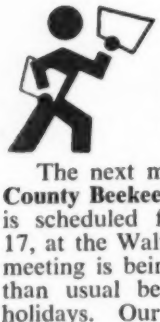
FORAPIN can reportedly be used for rheumatism, arthralgia, Myalgia, neuralgia and other comparable diseases. The advertisement lists six other body conditions that can be treated by this medication, Forapin.

The Color of Honey:

TWO LADIES, looking at the various honeys, were discussing the reason for the different colors and one informed the other: "The dark honey is from dark bees, my dear, and the light is from light bees!"

British Bee Journal. Sept. 29, 1955.

XUM



Just News

The next meeting of the **Middlesex County Beekeepers' Association (Mass.)** is scheduled for Saturday, December 17, at the Waltham Field Station. The meeting is being held one week earlier than usual because of the Christmas holidays. Our Christmas meeting is always a gala one, with an exchange of small gifts among the members, carol singing, and a hoped-for visit from Santa Claus.—L. C. Proctor, Sec.

The **Midwestern Beekeepers' Association** will meet at the I.O.O.F. Hall, 812 Westport Road, Kansas City, Mo., on December 11 at 2:30 p.m. Election of 1956 officers, general discussion, a movie, door prize, and refreshments. —Mrs. William Brite, Sec.

The **Louisiana State Beekeepers' Association** will hold its annual meeting on December 12th in Baton Rouge. The program calls for registration at 9:00 and meeting called to order at 10:00 a.m. in the Court of Appeals Room, 4th floor of State Capitol Building.—Geo. L. Lott.

The **Westchester County Beekeepers' Association** will hold its annual Xmas party at the Odd Fellows' Hall, 20 Lockwood Ave., New Rochelle, N. Y., on Sunday, December 18, at 2:30 p.m. sharp. Each member and their family, including visitors are requested to bring a gift, not to exceed 50 cents. Santa Claus will be on hand to distribute these gifts. Movies will be shown for the children and Christmas carols will be sung. A buffet supper will be served by the "Queen Bees." Let's make this a Gala Xmas Party. — Mrs. Alfred Roth, Pub.

The **Southern Tier Beekeepers' Association of New York** will hold its next meeting on December 13. Officers elected at the last meeting are: Rosco Green, Chenango Bridge, President; Fred Brown, Friendsville, Vice-president; H. B. Webb, Port Crane, Secretary.

Bee Bee Seed Available. We are advised by Mr. Fred W. Schwoebel that he has collected a substantial amount of the seed of the Bee Bee Tree (see article in November Gleanings) and beekeepers wishing to make a test planting will be furnished sufficient seed for that purpose without cost as long as the supply lasts. Address inquiries, enclosing a stamped self addressed envelope, to Mr. Fred W. Schwoebel, Curator Langstroth Bee Garden, Morris Arboretum, Chestnut Hill, Philadelphia, Pa.

Pennsylvania Honey Show—There is a class for all colors of honey at the Pennsylvania Farm Show in January. Plan to bring in 10 pounds in one-pound jars and also two five-pound jars. Honey may be labeled. The premium list may be secured from your County Agricultural Extension Office. Entries for the collective exhibits must be submitted to the Farm Show Commission before December 1, 1955.—W. W. Clarke, Jr., Pennsylvania Extension Apiarist.

The **Empire State Honey Producers' Association** will hold its annual two-day winter meeting at the Van Curler Hotel, Schnectady, New York, December 9 and 10. The general theme will be getting more return per colony and how to lower production costs. There will be a honey cooking demonstration for the ladies. Speakers expected are Commissioner of Agriculture Dan Carey, Mr. G. F. Townsend, Mr. Shuel, and Mr. Braun from Canada. All interested in beekeeping are invited to attend.—Mary Cary, Sec.

The **Montana State Beekeepers' Association** will hold its 35th Annual Convention December 2 and 3 in Livingston, Montana.—Lester Hall.

New York State's 1955 honey crop will be better than last year, but production will still be below average, according to Dr. E. J. Dyce, Cornell Extension apiarist.

Clover, the bee's main source of honey during the summer, was in good shape this spring, but dried up during the summer to limit honey production

in most of the state. Central and eastern counties in New York received better rains during the summer and there was an average honey crop in those areas, Dr. Dyce said. Throughout the nation estimates are for an average honey crop and prices should remain stable, he added.

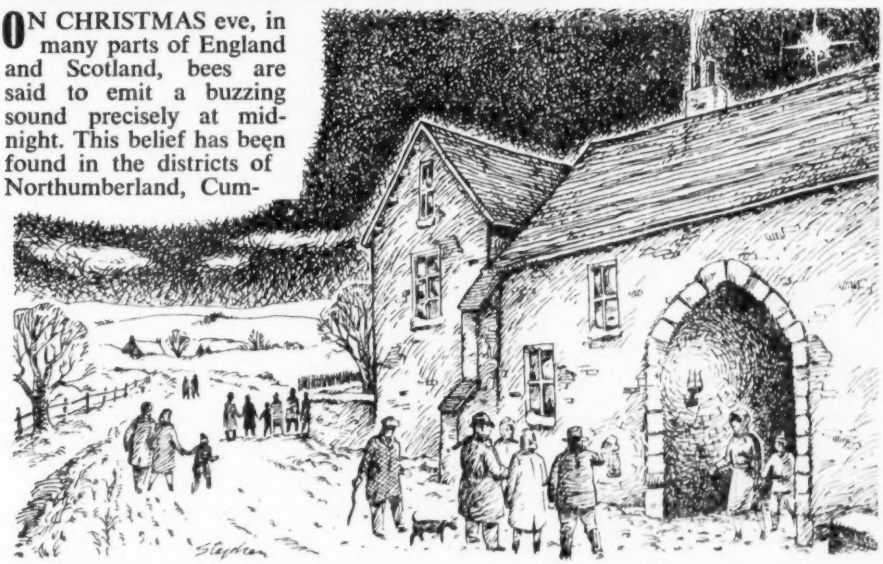
The annual convention of the **New Jersey Beekeepers' Association** will be held Thursday, January 26, 1956 at the Auditorium, Y.M.C.A., 140 East Hanover Street, Trenton, New Jersey, with Rudolph Patzig, President, presiding.

Beekeeping Featured on Minnesota Farm and Home Week.—The beginning beekeeper as well as the seasoned apiarist will find a program packed full of information during the University of Minnesota's annual Farm and Home Week January 10-13 on the St. Paul campus. The sessions, planned for each of the four days of the University of Minnesota's biggest short course, will begin Tuesday afternoon, January 10, with a provocative discussion, "Shall I Keep Bees or Play Golf?"

On succeeding days such problems will be considered as bee poisoning and other hazards of beekeeping, preparing colonies for honey flow, fall management and wintering, pollen and pollen substitutes. Speakers will include T. A. Gochnauer, Jane Leichsenring, F. G. Holdaway, M. H. Haydak, all of Univ. of Minnesota, Richard Dorer, Minn. State Dept. of Conservation, T. L. Aamodt, C. D. Floyd, Minnesota State Dept. of Agriculture, and commercial beekeepers.

Bee Lore

Illustrated by V. R. Stephen



ON CHRISTMAS eve, in many parts of England and Scotland, bees are said to emit a buzzing sound precisely at midnight. This belief has been found in the districts of Northumberland, Cumberland, Yorkshire, Wiltshire, and in Fife and Northeast Scotland. Some say that this belief is a result of dissatisfaction that arose when the calendar was changed in 1752. In Yorkshire it was the custom to go and watch the beehives on the old and new Christmas eves to determine the right one. It was the belief that the bees would make a humming noise when the birth of Christ took place. Since the bees dislike changes local belief affirms that this humming takes place on the old Christmas eve.

XUM

Let's talk about honey plants

HARVEY B. LOVELL, University of Louisville

Saw palmetto (Serenoa serrulata). A clump on sand dune in central Florida.

Palm Trees. An important source of nectar in Florida and to a lesser extent in many southern states is the palm family. There are a dozen or more species which are common enough to be of value to beekeeping and all with which I am familiar are excellent nectar producers.

The most valuable species is the saw palmetto (**Serenoa serrulata**), a dwarf, scrub species which forms a dense cover over hundreds of acres of pasture and pine land. It grows from the coast of the Carolinas around the Gulf Coast to Eastern Texas. The edges of the fan-shaped leaves are covered with sharp teeth which give the plant the name of saw palmetto. It blooms in early summer, each plant having dense clusters of small yellowish flowers. The honey is a rich yellow color with a pleasing distinctive flavor. It is considered a good table honey and is a good seller especially in Florida.

Cabbage palm (Sabal palmetto) is another source of surplus honey over a wide area in the southeastern states. This species grows into a large tree and is the only native palm in northern Florida, the coast of Georgia and the Carolinas. Many of the coastal islands in South Carolina are covered with stands of cabbage palms. Each tree has several large clusters of yellowish flowers similar to those found in the saw palmetto. They bloom for a long time during the summer months.

According to Robert Foster, the honey is so thin it often ferments and blows the cappings but in a dry season the honey is fairly good although it does not have the quality and flavor of saw palmetto.

This tree is very important in the life of the Seminole Indians. They use the leaves for roofing, eat the central bud, and then cut the trees for timber and firewood. The last time I was in Florida I was served cabbage palm buds under the name of swamp cabbage as a vegetable in a restaurant. The flavor was interesting and different.

The late Jay Smith wrote me that he sometimes made as much as 40 pounds from this tree at Fort Meyers and E. R. Raley of Daytona reports that he has made as much as 100 pounds but that 30 pounds is an average yield.

In Louisiana and East Texas a dwarf species of palmetto (**Sabal minor**) is one of the most important honey plants, chiefly in damp bottoms. Everett Oertel, U. S. Department of Ag-

riculture, once made from 65 to 200 pounds per colony from his palmetto in an experimental apiary. He describes the honey as being of high quality.

In central Florida, the most commonly planted tree is the plumed cocoanut locally called cocos plumosus (not the true coconut), and in the southern third of the state the royal palm (**Roystonea regia**) the most beautiful species in Florida is extensively planted as a shade tree. Both are much visited by bees and must add considerably to the crop.

Golden Honey Plant. I received a large specimen of this plant from Walter Kelley of Clarkson, Kentucky, early in October with the request that I identify it for him, because a beekeeper had told him that it is a good honey plant. This plant, also called wingstem and stickweed, is an overlooked honey plant in many localities. It is a tall coarse species often confused with ironweed and locally known as yellow ironweed. The yellow flowers often look ragged because only a few of the yellow rays develop. Honeybees don't mind, however, and it is nearly always worked very eagerly throughout its blooming period.

Cajeput of punk tree (**Melaleuca Leucadendra**) is fast becoming a popular tree in Florida. It comes from Australia where it is known as the broad-leaved tea-tree and where it is listed as an important plant for build-up.

Goodacre in "The Honey and Pollen Flora of New South Wales" writes, "The honey extracted is rather dark in color, of strong flavor, and candies rapidly. It is not generally favored as a table honey, and care has to be exercised when using it in a blend, the flavor and aroma being so strong. This species flowers during the winter along the coast generally."

I am indebted to the Florida Honey Cooperative at Umatilla for a bottle of Melaleuca honey. This sample is amber with a very unpleasant odor and taste quite unfit for use as a table honey.

There is a campaign under way in Florida to discourage people from planting punk trees near orange groves because a small amount of this strong dark honey will ruin the color and flavor of the orange honey. Robert Foster, former inspector, told me that there are quite a few cajeput trees in the Everglades, and that the dark honey is sometimes used in baking.

Thoughts on Wintering

M. J. DEYELL, Editor

FOR SOME YEARS, since we began wintering colonies in double-story brood chambers, we make an upper entrance for each colony in addition to the regular lower entrance, by boring a three-quarter inch hole in the upper brood chamber just below the hand-hold. This upper entrance seems to serve as a safety valve, in that the bees can easily get out for a winter cleansing flight on a day warm enough for bees to fly. In case a sleet storm freezes over the bottom entrance, or it gets clogged with dead bees, the bees can always get out through the upper middle entrance. Furthermore, this middle entrance helps bees to expel excess moisture which may accumulate during cold weather.

For those who do not wish to mutilate the hives by boring holes, a simple way to provide a top entrance is to cut an inch opening in the front of the rim of each inner cover, then turn it upside down and push the telescope cover forward as far as it will go. This gives the bees space to fly out and in. Also, the outer telescope cover helps to prevent the wind from blowing directly into this entrance. When this top entrance is no longer needed in the spring the inner cover may be turned over to its normal position.

Remove Queen Excluders During Winter

If excluders have been used over the bottom brood chambers during the late summer and fall, be sure to remove them before cold weather sets in. If left on, queens might get isolated below winter clusters and perish during the winter.

XUM

1955 Honey Production and Stocks on Hand September 15 For Sale

State and Division	Col. of bees: 1954	Col. of bees: 1955 2/	Yield per col.: 1954	Yield per col.: 1955 2/	Honey prod. 1954 1/	Honey prod. 1955 2/	Hon. for sale in prod. hand on 9-15-55
	Thousands		Pounds		Thous. pounds		Thous. pounds
Maine	8	6	12	26	96	156	44
N. H.	5	4	12	37	60	148	89
Vt.	11	10	46	41	506	410	266
Mass.	31	28	15	17	465	476	181
R. I.	2	2	13	17	26	34	10
Conn.	17	13	15	16	255	208	67
N. Y.	221	199	28	45	6,188	8,955	3,313
N. J.	32	32	24	19	768	608	365
Pa.	168	148	20	25	3,360	3,700	1,221
N. Atl.	495	442	23.7	33.2	11,724	14,695	5,556
Ohio	289	292	24	45	6,936	13,140	4,862
Ind.	178	180	32	48	5,696	8,640	3,370
Ill.	164	157	43	50	7,052	7,850	3,454
Mich.	185	185	36	50	6,660	9,250	4,532
Wis.	204	208	53	83	10,812	17,264	9,840
E. N. Cent.	1,020	1,022	36.4	54.9	37,156	56,144	26,058
Minn.	243	243	80	89	19,440	21,627	8,435
Iowa	185	165	56	106	10,360	17,490	6,471
Mo.	137	119	19	30	2,603	3,570	393
N. Dak.	13	14	140	128	1,820	1,792	806
S. Dak.	24	30	115	115	2,760	3,450	1,173
Nebr.	43	43	75	92	3,225	3,956	1,701
Kans.	48	45	28	35	1,344	1,575	567
W. N. Cent.	693	659	60.2	81.1	41,552	53,460	19,546
Del.	3	3	30	33	90	99	40
Md.	30	26	28	35	840	910	410
Va.	143	136	28	27	4,004	3,672	1,395
W. Va.	122	109	18	19	2,196	2,071	518
N. C.	193	183	26	19	5,018	3,477	1,008
S. C.	59	50	14	18	826	900	225
Ga.	205	189	20	14	4,100	2,646	476
Fla.	238	238	74	62	17,612	14,756	4,427
S. Atl.	993	934	34.9	30.5	34,686	28,531	8,499
Ky.	139	126	15	22	2,085	2,772	693
Tenn.	170	148	11	18	1,870	2,664	613
Ala.	190	171	16	19	3,040	3,249	487
Miss.	73	73	22	22	1,606	1,606	594
Ark.	92	89	19	25	1,748	2,225	445
La.	93	93	26	22	2,418	2,046	512
Okla.	50	48	21	30	1,050	1,440	432
Texas	280	266	27	41	7,560	10,906	2,181
S. Cent.	1,087	1,014	19.7	26.5	21,377	26,908	5,957
Mont.	68	71	85	92	5,780	6,532	3,331
Idaho	174	174	52	42	9,048	7,308	2,631
Wyo.	33	33	93	90	3,069	2,970	980
Colo.	68	65	56	73	3,808	4,745	2,325
N. Mex.	15	16	35	60	525	960	518
Ariz.	77	79	69	65	5,313	5,135	1,695
Utah	50	47	50	52	2,500	2,444	1,320
Nev.	14	14	70	60	980	840	588
Wash.	86	81	50	34	4,300	2,754	909
Oreg.	55	50	27	35	1,485	1,750	525
Calif.	537	537	63	52	33,831	27,924	12,007
West.	1,177	1,167	60.0	54.3	70,639	63,362	26,829
U. S.	5,465	5,238	39.8	46.4	217,134	243,100	92,445

1/ Revised 2/ Preliminary

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 18c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 2.

MICHIGAN'S finest raspberry, basswood, clover comb honey, in 4 x 5 window cartoned sections. Extra fancy, $8.00; Fancy, $7.00; No. 1, $6.00; No. 2, $5.00 case. E. Z. Quick Way B Farms, Boyne Falls, Mich.

LIGHT AMBER HONEY in 60's. Sample, 20c. Joseph Fekel, Vineland, N. J.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for all types extracted honey. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH for Beeswax. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR Shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. A. I. Root Company of Syracuse, 1112-14 E. Erie Blvd., Syracuse, N. Y.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Company, Millersport, Ohio.

WANTED—White clover honey, carload or truckload. Send sample and lowest price. Cloverdale Honey Co., Fredonia, N.Y.

WANTED—Aster or stick weed honey, any amount. Will pay good price. Send sample. Robt. Lane, Greeneville, Tenn.

BEST CASH Deal for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

BEESWAX WANTED — Highest prices paid in cash or trade for bee supplies. The A. I. Root Co., Medina, Ohio, Council Bluffs, Iowa, San Antonio, Texas.

WANTED—All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, Ohio.

WANTED—Honey in 60's. Send sample and price. Lloyd E. Allen, Tipton, Mich.

WANTED—Buckwheat and some clover honey. Eastern Food Products, 115 Division Ave., Brooklyn, New York.

WANTED, chunk comb and extracted honey. Mail sample and prices. Stoller Honey Farms, Latty, Ohio.

WANTED all grades of extracted, also 1500 cases or less of cut comb honey. Honeymoon Products Co., 39 E. Henry St., Box 85, River Rouge 18, Mich.

FOR SALE

WRITE FOR CATALOG — Quality Bee Supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. KD., 10 or more, $1.00 each; 50 or more, 90 cents each; 100 or more, 85 cents each. One nailed up sample postpaid, $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

COMB FOUNDATION PLANT OF THE EAST—that's WAX WORKERS, 1330 Slaterville Road, ITHACA, NEW YORK.

FOR SALE — 8-frame Root equipment for 700-colony apiary. Write for details to E. H. Wadleigh, Monte Vista, Colo.

QUEENBEE PAINTING OUTFITS, $1.50 postpaid. Southwick Apiaries, Waban, Massachusetts.

FOR SALE: Old Taylor Honey Company honey packing business. See display ad page 711.

FOR SALE — Several thousand queen cages, any size. L. E. Allen, Tipton, Mich.

SEEDS

HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Iowa.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

CAUCASIAN queens, balance season, 1 queen, $1.00; 25 or more 75 cents each. Lewis & Tillery Bee Co., Greenville, Ala.

BEES AND QUEENS for 1956. Starline and our regular stock. Shipment will start in January. Alamance Bee Company, LaBelle, Fla.

LEASE OR SELL, cash, 500 colonies. John Yanik, 16036 Edmore, Detroit 5, Mich.

ITALIANS — Packages, queens. Martz, Rt. 2, Box 846, Vacaville, California.

FOR SALE — 100 two-story colonies, state inspected. The Hubbard Apiaries, Onsted, Michigan.

WIDOW must sell 35 colonies, and equipment, radial extractor, stainless steel pasteurizer, etc. Write: Robert Loper, 5643 Plymouth Road, Ann Arbor, Mich.

FOR SALE — 75 10-frame colonies of bees with some extra supers. E. A. Quivey, Bowen, Illinois.

Three and four-frame nuclei for sale, one or a truck load. Walker Apiaries, Pharr, Texas.

FOR SALE—80 colonies, or more, double brood chamber, heavy. Big lot used equipment. Have kept bees 68 years. Must contract. Come see them. Dr. William C. Wilson, St. Charles, Missouri.

MISCELLANEOUS

ROYAL JELLY. 30 capsules $1.50. Capsul contains Royal Jelly, 10 mg., Vitamin B, 5 mg., Calcium Pantothenate, 5 mg. Eight-ounce jar honey with 320 mg. Royal Jelly $2.00 or $18.00 per dozen. Prairie View Honey Company, 12303 12th Street, Detroit 6, Michigan.

"Adventures in Beekeeping." Illustrated. $2.00. Robert Oglesby, R. R. 1, Middletown, Ohio.

VALUABLE INFORMATION on keeping bees contented and working. Read my book on "HOW TO ADD A SECOND QUEEN AND WHY." It discusses a new theory on the real cause of swarming, and my system of control. Price $4.00. Apply to W. F. Perschbacher, 9620 107A Ave. Edmonton, Alta. Canada.

I would like to know a supplier of packages of bees and queens. I also buy honey in bulk. Write in French if possible. Julian Lefebvre, Marchand de Miel, Beauharnois, Que., Canada.

HELP WANTED

WANTED—Reliable man for 1956 queen and package season. Howard Weaver, Navasota, Texas.

WANTED—Experienced bee man. Immediate work, housing furnished. Most modern equipment to work with. Raymond Thomas, Inc., Five Points, Fresno County, Calif.

WANTED — Expert beekeeper — permanent position. Farr, 4851 Paddock Road, Bond Hill, Cincinnati, Ohio.

HONEY LABELS

Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.

C. W. AEPPLER COMPANY

Oconomowoc, Wisconsin

Caucasian

PACKAGE BEES & QUEENS

For 1956

Howard Weaver's

Navasota, Texas

Booking orders now. Over 30 years a shipper. Send for Free Circulars.

BLUE BONNET APIARIES

Weslaco, Texas

JOHN DAVIS QUEENS

We ship until November 1 and fall is the right time to requeen. Order now and be sure. $1.00 each, any number.

LITTLE'S APIARIES

Shelbyville, Box 122, Tenn.

BETTER BRED QUEENS

Three Banded Italians

Thank you for business you gave us this season. Booking orders for 1956.

Calvert Apiaries, Calvert, Ala.

HONEY WANTED

Carloads and less than carloads. Mail sample and best prices in all grades.

C. W. AEPPLER COMPANY

Oconomowoc, Wisconsin

"Glory to God in the highest, and on earth, peace, good will toward men." Luke 2:14

We here at
ROSSMAN APIARIES

Wish you everywhere a most pleasant and Merry Christmas. May God bless you all in your undertakings in the future.

Watch our ads in January issue for 1956 prices.

Going South? We have a cabin for your convenience. Stop over with us.

Rossman Apiaries

P.O. Box 133 Moultrie, Ga.

ITALIAN
Package Bees and Queens
Jackson Apiaries
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The New Zealand Beekeeper
The Quarterly Magazine of the National Beekeepers' Association of New Zealand. Better Beekeeping — Better Marketing. Subscription, 8 shillings per year, payable to
THE GENERAL SECRETARY
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Italian Queens
EUGENE WALKER
Rt. 2, Box 892
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MAGAZINES

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarh Dist. Naini Tal, U. P. India, or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs1/8/, or s2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

Archiv fur Bienenkunde, International journal for Bee Culture and beekeeping economics. Founded in the fall of 1918. Oldest economic bee journal in the world. Praised again and again for its decades of independent leadership through many endorsements and advice as a valuable source also for the practice. Classic. Yearly DM 5.50. Any aspiring beekeeping friend will receive a sample copy. Biene-Verlag, Giebelbach, Lindau, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With Apicultural Abstracts it costs $3.00 per annum. Apicultural Abstracts only $1.75 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

DO YOU FIND it difficult to secure information about sheep and sheep ranching methods? The SHEEP AND GOAT RAISER reaches more sheepmen with more information on range sheep than any other magazine published. Subscription $1.00. Hotel Cactus, San Angelo, Texas.

QUEENS
Italians Caucasians
Merry Christmas to all and a very **Happy New Year.**
MITCHELL'S APIARIES
Bunkie, La.

Answers to Crossword Puzzle, page 744

You'll get
BETTER BEES & QUEENS
From these members of
The American Bee Breeders' Ass'n.

Weaver Apiaries — Navasota, Texas
Alamance Bee Company — La Belle, Fla. and Graham, N. C.
Bessonet Bee Company — Donaldsonville, La.
J. M. Cutts & Sons — Shipley, Fla.
E. J. Bordelon Apiaries — Moreauville, La.
Wicht Apiaries — 406 Miller St. — Hattiesburg, Miss.
Jackson Apiaries — P. O. Box 58 — Funston, Ga.
Wilbanks Apiaries — Claxton, Ga.
Jensen's Apiaries — Macon, Miss.
The Puett Company — Hahira, Ga.
Rossman Apiaries — P. O. Box 133 — Moultrie, Ga.
Little's Apiaries — P. O. Box 122 — Shelbyville, Tenn.
York Bee Company — Box 300 — Jesup, Ga.
Sunkist Bee Co. — Convent, La.

"HIGH QUALITY IS **ALWAYS** A BARGAIN"

WEATHER AND NECTAR SECRETION

(Continued from page 733)

fruit trees), last year's weather may influence this year's honey crop. The amount of reserve food stored in roots of herbs, and in roots, stems, and branches of shrubs during late summer and early fall will influence the growth of the plant in the following spring. This reserve may be reduced by conditions of prolonged drought, excessive rainfall, or excessively high temperatures in the latter part of the season. The nectar producing potential in the following year will almost certainly be affected, especially in fruit trees, which flower before the leaves expand.

In conclusion it should be reiterated that weather is not a collection of independent conditions but a complex, and that it is meaningless to consider the influence of any particular feature of it without due regard for other weather and soil conditions. The best years for honey production in a particular locality will be years in which conditions of sunshine, temperatures, and soil water are ideal for the major honey plants of that area. The End.

PACKAGE BEES AND QUEENS
Three-banded Italians

	1 to 50	50 up
Queens	$1.10	$1.00
2-lb. pkg.	3.50	3.25
3-lb. pkg.	4.50	4.25

Live delivery guaranteed.
AUTAUGA BEE FARM
Owned and Operated by
J. H. Moody and W. L. Strength
Prattville, Ala.

J. E. WING & SONS
42 Years Continuous Service
Italian Package Bees
and Queens
Our Specialty
Knights Landing, Calif.

HOLLOPETER'S ITALIAN QUEENS
Young Laying Queens .....$1.00 each
Return Mail
WHITE PINE BEE FARMS
Box 810 ROCKTON, PA.

Package Bees & Queens
Quality & Service
C. F. KOEHNEN & SONS
Glenn, California

Quality Bred Italian Queens

Ready for late requeening
$ .75 each Air Mail
8.00 per dozen Air Mail
1.00 ea. Nov. 1 through May 15
Prices subject to change without notice.

Walter D. Leverette
P. O. Box 364 Fort Pierce, Fla.

QUEENS for 1956
John M. Davis strand, leading queens for over 40 years.

Begin shipping March 15th
Price U.S.A. and Canada
1 to 25 .....$1.00 each
Above 25 ..... .85 each

Air mail and special handling, Europe and South America shipments, add 15 per cent.

Phone 466-R5

O. K. ANDERSON & SON
193 P. O. Box
Coffee Springs, Alabama, U.S.A.

CARNIOLAN and CAUCASIAN

Queen rearing for 1955 over. Demand for Carniolan and Caucasian queens was beyond our ability to supply on account of the freeze in March and April, but we are hoping to do better in quantity and quality for 1956. Booking orders now for early March and April queens.

W. D. REAMS
Box 87 LaBelle, Fla.

OLDEST BEE JOURNAL IN THE ENGLISH LANGUAGE

Keep up on markets, practices, scientific data, regulations and plant possibilities.

1 year, $2.00, U. S. and Canada
Foreign postage, 50c a year extra

AMERICAN BEE JOURNAL
Hamilton, Illinois

NATURE OF HONEY

(Continued from page 735)

It has been a rather common but incorrect assumption that honey that had "gone to sugar" was an undesirable product because it may have spoiled, which may actually be true with fermentation after granulation if the yeasts have not been destroyed by proper heating and their re-entry prevented. Further prejudice has been due to the fact that when honey once is heated to prevent or retard granulation, then any later granulation is likely to be made up of large, coarse crystals which do not have a creamy texture.

It is a basic fact that the size of crystals in honey granulation is primarily due to the speed of granulation. This fact is taken into consideration when "creamed honey" is processed. A honey with a high granulation tendency is preferred. It is heated to a temperature of 150-160°F. to destroy yeasts and melt all crystals, then cooled to about 80°F. after which slightly more than five per cent of ground crystallized honey, or previously processed, finely granulated honey is added and thoroughly mixed, after which the honey is placed in the ultimate containers and stored at about 57°F. until fully crystallized. It is then removed to ordinary room temperatures, except for honeys of high levulose content which tend to soften and liquefy at room temperatures. This is the Dyce process on which the Cornell Research Foundation, Ithaca, New York, secured patent rights in the early 30's.

The seeding with fine crystals and storage at good granulation temperatures results in rapid granulation giving a smooth creamy texture. Tupelo, climbing milkweed and most fall flowers are not especially adapted for making creamed honey because of their high levulose content and slow granulating tendencies.

As stated in the previous article and depicted in the diagram of the "Honey Maze-Complex Factor-Effects" there are four main points of consideration in the production and care of honey, namely color, aroma and flavor, granulation, and fermentation.

U. S. Savings Bonds come in all sizes . . . . . and grow bigger every year.

XUM

Wishing every Beekeeper
everywhere
a

VERY MERRY CHRISTMAS and a HAPPY PROSPEROUS 1956

When you need bees and queens,
think of us, please.

The Stover Apiaries
Mayhew, Miss.

DADANT'S STARLINE HYBRIDS and
GARON'S THREE-BANDED ITALIANS

1955 has left its marks in our experience. This means further readjustments. Look for our future ads.

Season's Best Greetings.
GARON BEE COMPANY **Donaldsonville, La.**

DADANT'S STARLINE HYBRIDS
Reg. U.S. Pat. Off.

SEASON'S GREETINGS
to
All Beekeepers Everywhere

Our manner of operations may vary considerably according to geographical location of our businesses, but the end to which we strive is very much the same; i.e.; a reasonable degree of Sucess and Satisfaction in our enterprises that culminates in Happiness in our profession.
Our Very Best Wishes for a Prosperous New Year.
JENSEN'S APIARIES **MACON, MISS.** **U.S.A.**

DADANT'S STARLINE HYBRIDS
Reg. U.S. Pat. Off.

PACKAGE BEES & QUEENS
"Italians"
Quality Does Not Cost—It Pays
THE WILBANKS APIARIES
Claxton, Georgia

1956
Italian Queens Package Bees
W. E. PLANT
Hattiesburg, Mississippi

HONEY WANTED All Grades, Send Samples Advise Quantity and Price
"Everything for the Beekeeper"
HONEY SALES COMPANY 2817 No. 2nd St. Minneapolis 11, Minn.

YORK'S PACKAGE BEES & QUEENS FOR 1956

The Preference of Leading Honey Producers

Looking back on 1955 perhaps many realize the necessity for some changes in methods of operating. With higher expenses facing many operators, it is imperative for everyone to plan for higher quality packages and queens for a more efficient operation. Better quality packages and queens from YORK filling some of that extra equipment will pay off in additional income.

DADANT'S STARLINE HYBRIDS

Reg. U.S. Pat. Off.

Write us today of your plans making arrangements for this season's requirements. We are now booking orders for 1956. Whether you are a hobbyist or a commercial beekeeper, you will find buying quality stock from fulltime specialists in beekeeping profitable. Advice and information for shipments by parcel post, express, and truck gladly given. Italians, bred for outstanding commercial production, and Dadant Starlines, product of controlled breeding, are available from the same source. Try these lines in 1956.

DADANT STARLINES Quality Bred YORK ITALIANS

YORK BEE COMPANY Jesup, Georgia

P.O. Box 300 (The Universal Apiaries) 412 W. Orange Street

HOLIDAY GREETINGS

The Bessonet Bee Company extends to all a very **Merry Christmas** and **Happy New Year.**

Our advice is to place your order early as the demand for package bees and queens will be heavy. Use GULF BREEZE stock and you know you have the best.

BESSONET BEE COMPANY **Donaldsonville, La.**

Buy U. S. Savings Bonds
They come in all sizes . . . .
and grow bigger every year.

Keep

Gleanings

Coming

MAIL THIS COUPON TODAY

OR—GIVE TO A FRIEND

GLEANINGS IN BEE CULTURE:
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Yes! Enter my subscription to Gleanings for the period checked below:

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50c per year extra for foreign

Name .....

Street .....

City ..... State .....

☐ Remittance enclosed. ☐ Bill me.

BIRD'SFOOT TREFOIL

(Continued from page 720)

Valley of California and westward to the Pacific Ocean, yields considerable honey during the summer and fall. Deer clover (**Lotus glaber**) is also reported to yield nectar in California.

H. A. MacDona'd has published an extensive monograph on "Bird's-foot trefoil (**Lotus corniculatus** L.), Its Characteristics and Potentialities as a Forage Legume," Memoir 261, Cornell University Agricultural Experiment Station, 1946. After very extensive studies he concludes that bird's-foot trefoil "presents distinct possibilities for hay and pasture production on the secondary, or poorer, soils where alfalfa is not successful, where red clover is too short-lived for the rotation used, and summer conditions too droughty for the persistence of white clover."

To summarize: If interest in bird's-foot trefoil continues at the present rate, within the next 10 years, it may become such a common forage plant in our northern states, that it will become a major honey plant. The honey will blend so well with clover and alfalfa, that the quality of the blend will be very similar to that now sold as clover honey.

XUM

Look for this Sign
When you Want
QUALITY AT LOW COST

Trade Mk. Reg.
U. S. Pat. Off.

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